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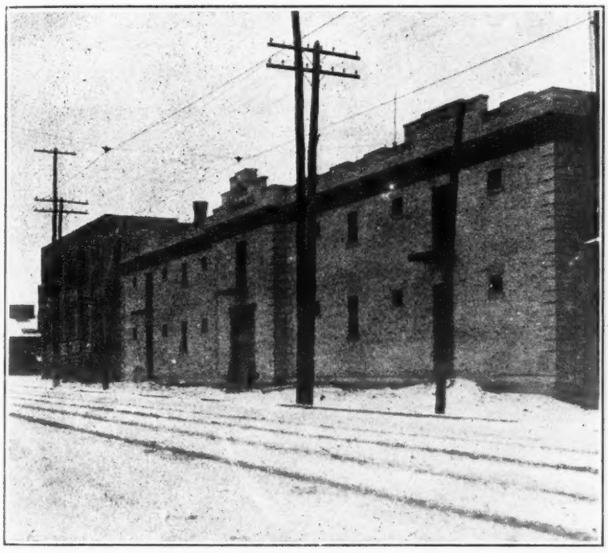
GARBAGE INCINERATION IN SCRANTON

Methods Previously Employed—City Collection—Regulations Governing Collections—Two Incinerators Just Completed—Description of Plants—Acceptance Test of Capacity and Cost of Operation



CITY STABLE, FRONT VIEW

THE city of Scranton, Pa., is about completing the organization of a new system of garbage collection which will take the place of some score or more of private collectors, and two new incinerators will dispose of the garbage. Agitation for these improvements began two years ago when Scranton was suffering from an epidemic of typhoid fever. Although the fever is believed to have originated from a polluted water supply, the prevailing insanitary method of garbage disposal was believed to have contributed toward the spread of the disease, and, on the urgent recommendation of Mayor J. Benj. Dimmick and Director of Public Works C. R. Acker, a modern system of handling garbage was decided on and is being installed.

Under the old system a number of contractors collected the household wastes and charged the householders various sums for the service. A garbage crematory of the old Vivarttas type which had a capacity of about twenty tons a day of mixed rubbish and garbage was maintained at the expense of the city. The crematory was operated up to its full capacity and the balance of the garbage, waste and ashes were dumped along the river bank, in the fields outside of the city, or in whatever place was most convenient, the health inspectors permitting. The old crematory was operated by a contractor who received the lump sum of $3,000 per annum. Of this amount, it is said, he paid out about $100 a month for labor, purchased what fuel might be necessary and recived about $80 per month from the sale of various materials picked out from the waste. The old crematory was objectionable on account of smoke and dust and was the cause of much complaint.

In order to carry out its plans of collection the city has purchased 22 Haywood end dump wagons and built a stable with room for 88 horses, intending to use many of them in connection with other branches of public work. The barn has large wagon sheds in the rear and there is plenty of space for getting the equipment in and out. The cost of the barn was about $33,000. The rules under which collections are made are as follows:

"Garbage" will be understood to mean and include all kitchen and table waste, swill, offal and market refuse, and all putrescible matter, both solid and liquid, animal and vegetable, which may result from the preparation of meat, fish, fowl and vegetables of any character, or which may be caused by the decay of foodstuffs.

Decayed or condemned vegetables, fish, oyster shells and fruit from dealers, and offal from slaughter houses, shall not be considered as garbage to be collected by the city, but it is understood that all such matter when delivered at the city incinerators will be received and treated as other garbage.

"Rubbish" will be understood to mean and include all rubbish and refuse incident to the ordinary conduct of the household, such as broken glass, stone or chinaware, paper, rags, bottles, shoes, etc. It shall not be held to include any substance that may accumulate as the result of maintenance of lawn or shrubbery or repairs to dwellings, or any building operations. Broken glass, stone or chinaware, bottles or tin cans must be kept separate from the other rubbish.

If the receptacles provided by the owners, residents or occupants of any premises are, in the opinion of the superintendent improper, it shall be his duty to notify the householder. If after such notice proper receptacles be not provided, garbage will not be collected until said notice shall have been complied with.

If any garbage receptacles shall also contain, deposited with garbage, any ashes or other substances not above described or defined as garbage or rubbish, the collectors will not be required to empty the same until properly separated by the householder.

All collections of garbage, rubbish and ashes shall be made between the hours of 6 a. m. and 6 p. m., except in cases of hotels, club houses, boarding houses, markets and buildings and other institutions, from which daily collections are made, where the collections may be made at any other hour agreed upon by the proprietor of such place and the superintendent.

Each and every wagon will be provided with sufficient help to make all collections rapidly and efficiently and no wagon shall stop at any place longer than is necessary to receive the contents of receptacles from the adjacent premises.

When the collector enters into or upon private premises he shall at once remove the rubbish and garbage to the street where it will be placed upon or into the collection wagons as soon as possible. It must be emptied completely, care being taken not to mar, break or in any way injure the receptacle, which must be immediately returned to its place in or upon the premises. Care must be taken not to spill or scatter any rubbish or ashes, and garbage, either solid or liquid, while handling the receptacles, and if any should be accidentally spilled by the collector it shall be carefully taken up and removed. Every effort will be made to have the work done in a quiet and orderly manner.

Each employee of the city engaged in collecting or removing rubbish and garbage in said city will be designated by a number, which will appear plainly on a badge worn conspicuously by said employee.

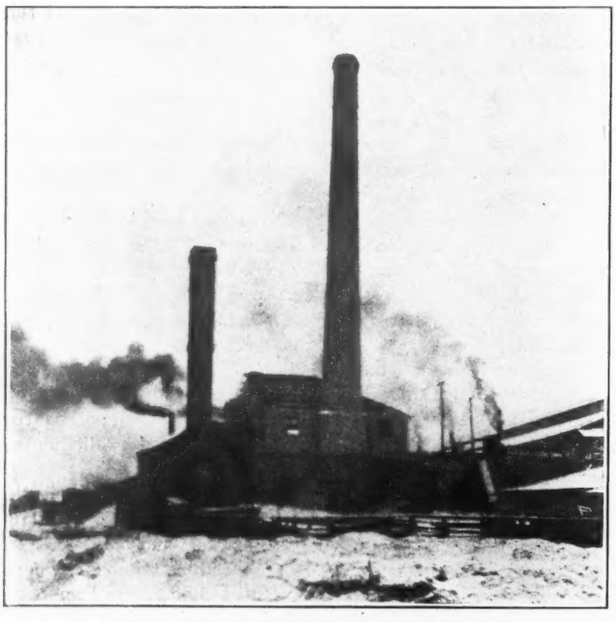
The collection and removal of garbage and rubbish will be as follows:

Within the half-mile circle from city hall, throughout the year, every week day, from such hotels, boarding houses, club houses, markets, groceries and such other buildings or streets as the director may direct.

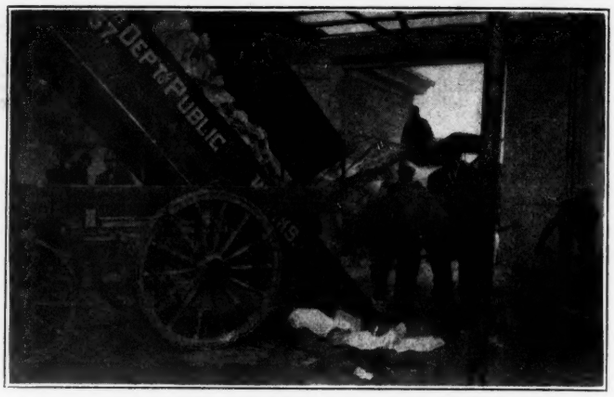
Within the half-mile circle from city hall, months of May to September inclusive, from such streets as the director may direct, three times per week; remainder of the city, during the same months, twice a week.

Within the half-mile circle from city hall, months of October to April inclusive, from such streets as the director may direct, twice per week; remainder of the city, during the same months, once per week.

For the final disposition of the garbage it was decided to build two incinerators located one in the north, the other in the south end of the city, each about a mile and a half from the business district. While these plants are not located in the best residence districts they are so situated that if very offensive odors should emanate from them they would constitute nuisance to a large number of people. The incinerators have been built by Lewis & Kitchen, of Chicago, Ill., at a cost of about $20,000 each. One of them was built close to the old incinerator, in fact within its enclosure, and the ramp

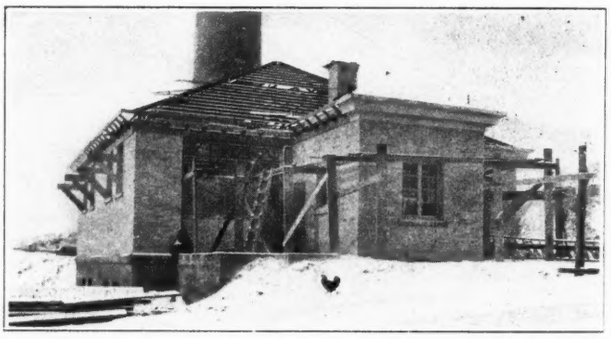


OLD AND NEW INCINERATORS AT GREEN LANE



CITY REFUSE CART

by which teams reached the old incinerator was carried over the new furnaces as they were built, without interfering with their construction. Before the old crematory was put out of service the new one was ready for operation. The two new plants are duplicates, except in the detail of the method of getting teams in and out. In the one at Bellevue, which is shown in the cut below, teams drive in from the street, on one side of the little office, turn around on the charging floor and emerge on the other side of the office to same street from which they entered. In the other plant, that at



BELLEVUE PLANT

Green lane, teams enter from the street and leave by a door leading into an alley on the other side of the plant. Both plants are located on a side hill so that all that shows from the street in front is a neat little brick building with a chimney of unusually large size in the rear.

The buildings are square with a frontage of 42 feet. The walls are 13 feet high and the peak of the roof, which is pyramidal in form, is 26 feet from the floor. The roof is covered with tile and is supported by a steel truss. The office is about 12 feet square. The tiles had not been put on the roof a few days ago, when the accompanying photographs were taken. The floor onto which the wagons drive is of reinforced concrete and forms the roof of the two incinerators underneath. The way in which the incinerators and the building are built together is claimed as a speical point of merit, giving strength with economy. Eight reinforced concrete posts support the roof and serve as supports to the walls of the furnace. Two of these posts are shown in the illustration of the front of the furnace as seen from the firing room.

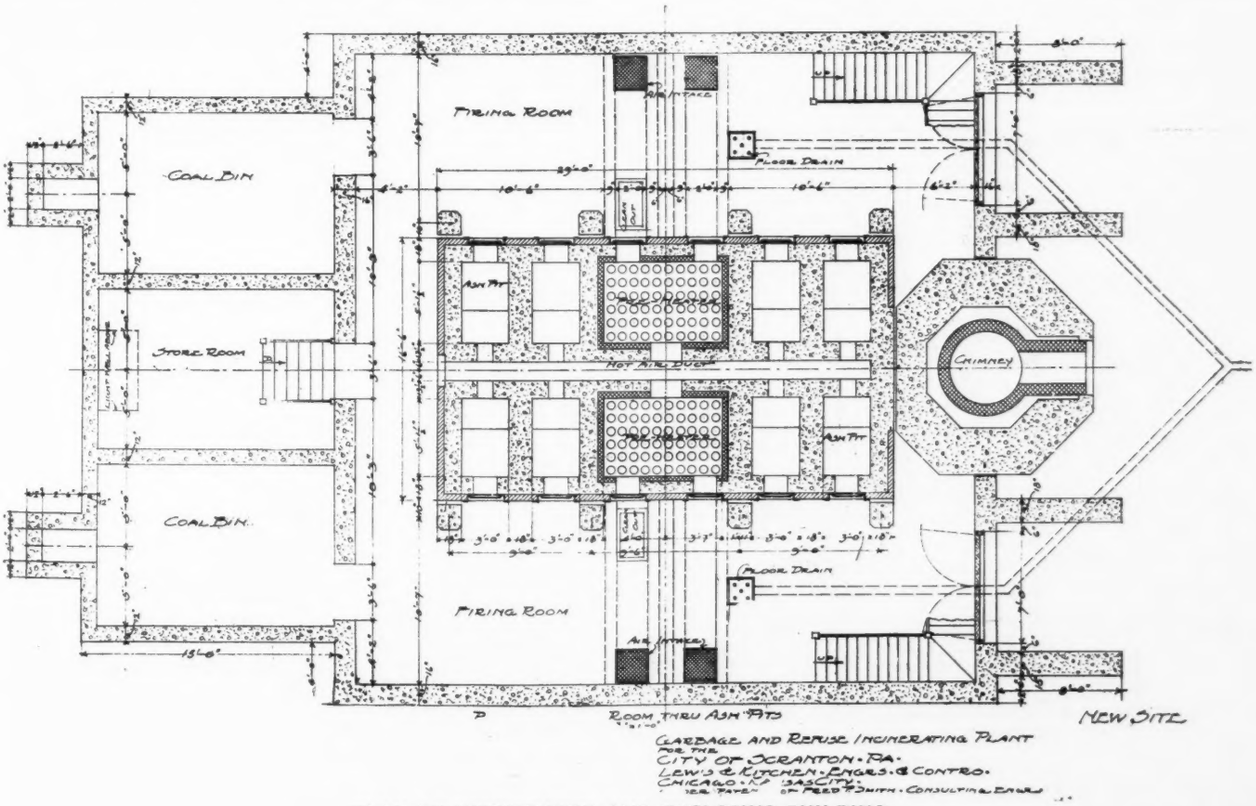
FIRING DOORS OF ONE CELL AND PRE-HEATER

The walls of the dumping or feeding room are lined with a dado of white enameled brick. This arrangement is to facilitate cleaning in case garbage should have to be piled up against the wall at any time. The walls can be easily washed down with a hose, the water escaping by a drain provided for the purpose. Garbage, under ordinary circumstances, is dumped directly into the furnaces through four manholes, the covers of which, made of iron and lined inside with cinder concrete, are removed by a chain hoist traveling on an overhead track, which passes in a circle over all the manholes.

The chimney is of the Custodis type, 135 feet high and 4 feet inside diameter. The foundation of the chimney is of concrete resting on piles. The base is only a few feet above the level of the river and at times of high water the lower part of the plant may be under water. The two furnaces are placed back to back and measure, each, 292 ft. x 9 ft. x 12 ft. deep, and are located in the center line of the building, allowing sufficient space on all sides for the firemen to work. On tracks in front of the furnaces runs a truck on which the firemen mount when working the fires through the upper doors.

Each furnace consists of two cells, with the corresponding parts oppositely arranged. Air is taken into the furnaces from the firing room through a duct about two feet above the floor level, thus carrying all odors in the building to the fires, where they are destroyed. The air goes through a duct under the floor to and through a pre-heater, and is then distributed to the under sides of the several grates of both furnaces through a distributing duct, one foot wide and three feet high, running between the two furnaces. The grates of the furnaces are of the shaking variety, but not dumping, and the spaces between the bars are very fine. The final combustion of the garbage takes place on these grates.

In starting the fires and when necessary coal may be burned on the grates. There are four grates to each furnace, each grate containing 16 square feet of heating surface. Each grate has its own firing door, and there are two fire doors over the pre-heater. Most of the tin cans and miscellaneous metal mixed with the garbage are worked down onto fires burning on grates in the center, between the furnaces. The top of the pre-heater, which contains 60 tubes, 3½ feet long and 6 inches in diameter, is under these grates. A wire netting is placed over the top of this to prevent occasional pieces of paper from escaping by the chimney. Between the grates and the roof, arranged as shown in the section, are drying platforms, on two levels, made of



PLAN OF INCINERATOR AND ENCLOSING BUILDING

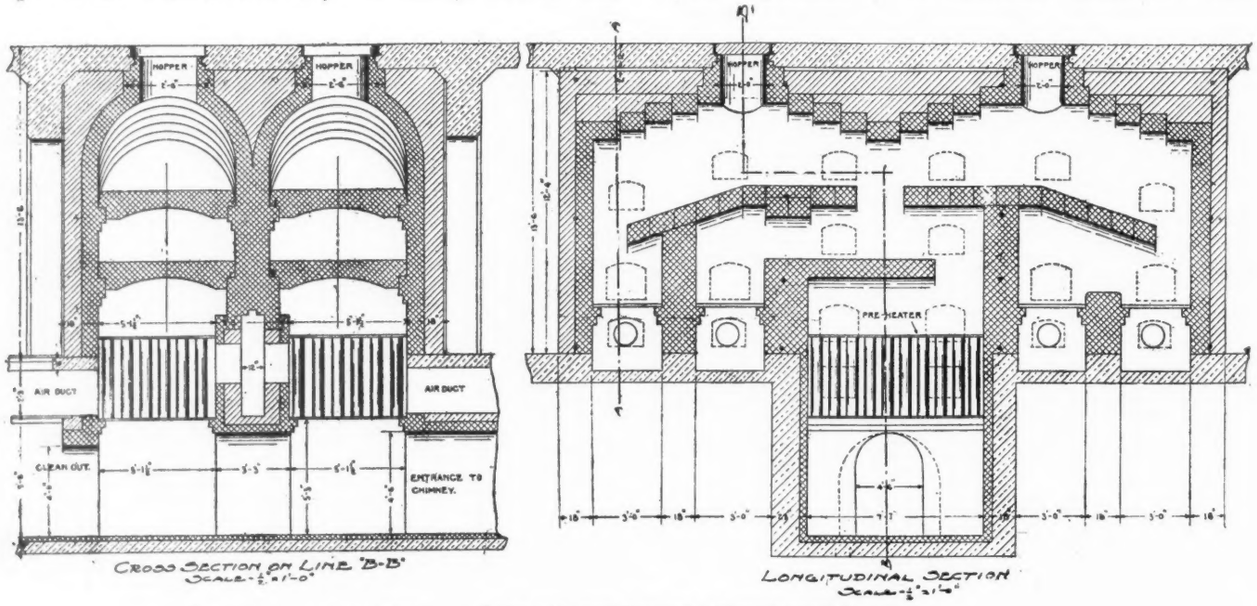
specially shaped heavy fire bricks. The garbage, when dumped through the manholes, falls onto the upper platform and is pushed by succeeding loads, or is worked by the firemen with pokers, down onto the lower platform and finally to the grates first described, where the combustion is completed.

An advantage claimed for the Scranton incinerators is the arrangement of the furnaces in two similar units —the point being that when a manhole is open in the floor above for dumping garbage it cools only one side of the furnace and the escaping gases are subjected to the high temperature of the other furnace before they escape.

Each of the two plants was built under a guarantee to burn 40 tons of garbage and rubbish during a day of 16 hours at a cost of operation, on this basis, of 27½ cents per ton for fuel and labor. This cost was figured as that of four men at $2 per day each to handle the plant, and one ton of No. 2 nut coal at $3 per ton to promote combustion. The plants were to be operated for fifteen days by the contractor as a test run. As a matter of fact, the city was unable to furnish continuously anything like even 20 tons a day, and a satisfactory test was therefore impossible. However, from tests made the officials in charge are satisfied that the specified capacity is furnished. Twenty tons of garbage and rubbish were burned one day in ten hours using only one furnace of the plant. With both sides of the plant in operation 20 tons were burned in five hours. Or, to state the official figures exactly, on January 11, 20,735 pounds of garbage and 18,695 pounds of rubbish were consumed by one furnace. The first load arrived at 7.45 A.M. and the last at 5 P.M. At 7 P.M. the furnace was clear and the fires out. On January 13, 28,765 pounds of garbage and 21,000 pounds of rubbish were put in the furnace between 7 A.M. and 5 P.M.; 20 tons of this, however, being put into the furnace before noon. Our representative was present during the latter date and found that the plant was apparently operating satisfactorily. There was no odor to be detected anywhere outside of the plant, and the smoke issuing from the stack was scarcely visible. The weights of material consumed were not estimates, but each load was weighed as it entered the plant.

No records were kept of the amount of coal used on the grates from time to time; but considerable was fed onto each of the grates on January 13, mostly onto the inner shaker grate, probably totaling at least a ton during the day. It seems probable that, with enough refuse to keep the plant working continuously at an approximation to its rated capacity, the amount of fuel required would be reduced. The difficulty encountered here in making a satisfactory test is one commonly experienced in testing garbage plants, since garbage cannot be obtained in any except the quantities naturally discarded by the citizens; and to store it for several days gives rise to a nuisance. Storing has also the disadvantage that the garbage is drained of its water, and the material fed to the furnace is dryer than when fresh; and, on the other hand, that, as not more than enough for one day's rated consumption is on hand, the furnace must be heated up for the one day's run instead of for six, which requires an undue amount of coal.

During the test four men were employed in caring for the furnace, instructed and assisted by three representatives of the contractor. The three men were green hands, and their ability to handle 40 tons a day, operating for sixteen hours out of the twenty-four (presumably in two shifts), could not be determined by this test; a further argument in favor of our suggestion, that a year's operation by the contractor constitute a test.



VERTICAL CROSS AND LONGITUDINAL SECTIONS OF INCINERATOR

STREET LIGHT CONTROLLERS

One Year's Experience in Liverpool, England—Lighting and Extinguishing Automatic and Simultaneous—Cost of Installation and Maintenance

In the MUNICIPAL JOURNAL AND ENGINEER for Nov. 28, 1906, was described a device which had just been introduced in England for automatically controlling and extinguishing gas street lights. These have been in use for more than a year in Liverpool and Mr. A. G. Smith, Superintendent of Street Lighting of that city, has reported on the experience gained with them during that time. He recommended that the use of these be extended by the annual appropriation of $37,500 (here and in the remainder of this article, a pound is assumed to be $5, which is nearly enough correct for the purposes of this article); and on Jan. 6 a committee of City Council recommended that he be authorized to spend one-fourth of this amount in completing the lighting of a portion of a district with these automatic controllers.

The city, for lighting purposes, is divided into 14 sections, which are again subdivided into districts, 15 in the center of the city and 11 in the suburbs. There is a foreman for each section and seven lighters to a district, giving an average of 111 lamps per man in the business part and 93 in the suburbs. One hour is allowed for lighting at sunset, one for extinguishing part of the lights at midnight and one for extinguishing the remainder at sunrise. In addition to the above, the lighter also cleans each lamp once a week. The repairs and other maintenance are undertaken by a staff of 54 employees.

In August, 1907, Councils authorized the purchase of a number of automatic controllers and by December of that year 272 were in operation at points where they would be subjected to the severest test of wind and traffic jarring. Each controller must be wound and adjusted weekly, the hour of lighting and extinguishing being changed at the same time to comply with the lighting table. One man has, with a little assistance, attended to this and also cleaned the lanterns, attended to the burners, etc.

It was feared that, owing to the varying temperature and heavy traffic, the number of stoppages of the controllers would be very great; but the failures are very rare, having averaged only 16½ per month, which is considered very satisfactory in view of the heavy vehicle traffic passing them. The new controller does away with the shock to lamps due to turning on and off, to opening and closing the lighting door, etc. Mr. Smith believes that the cost for replacing mantles will be reduced 40 per cent. by the controllers. Another saving is in gas, since all the lights can be turned on at the same time, thus saving an average of one hour burning per night.

The cost of the controllers was $6.50 for double lamps and $5.60 for single lamps. The lamps which are best adapted to the use of controllers cost $6.35 each for double lamps and $5.60 each for single lamps. The cost of installing the 272 controllers was $112.85. The maintenance of the lamps for 12 months was $574, the replaced mantles cost $105.50, the chimneys $16 and miscellaneous items $9, bringing the total maintenance up to $704.75, or an average charge per lamp of $2.59. The cost of the same items for the existing type of lamps averages $7.32. Mr. Smith estimates that if the 19,000 lamps in the whole city were supplied with controllers there would be a saving in gas alone of $12,300 a year.

WATER AND FIRE HYDRANT RATES

Should Be Governed by Cost of Furnishing Adequate Supply and Not by Rates Elsewhere—Average Rates and Hydrant Rentals—Free Water Evil

In a paper before the Indiana Sanitary and Water Supply Association, Mr. Frank C. Jordan, of Indianapolis, read on January 14 a paper entitled "Water Rates," which contained some information and ideas of more than passing interest. The prevailing idea of his paper was that rates should be neither made nor criticized by comparing them with those of other cities, but that the only way to make rates and the only criterion as to their justness is to consider the cost of furnishing an adequate supply of pure water under sufficient pressure, with due regard for as much economy as is consistent with such service. Pressure of Councilmen or others frequently effects a reduction in rates which is pretty sure to be followed by more or less serious results. In Chicago

> The rates have been reduced from time to time until at the present time the revenue of the water plant is not sufficient to provide a suitable supply of water and to keep up the plant in good condition, and we find the Water Department is compelled to revert to the tax budget for approximately one million dollars a year with which to make certain necessary repairs. I am informed that even this amount, which will be needed yearly for some time, is not sufficient to take care of the necessary extensions and new construction, and that these two items will have to be taken care of by additional appropriations from the tax budget.

It is, as he states, extremely difficult to get the people generally to take into account the various local conditions which make the rate in one town necessarily higher than the rates in some other nearby towns.

> From Columbus, O., Louisville, Ky., St. Paul, Minn., Kansas City, Mo., and from many other cities throughout the United States, we are receiving information that they are contemplating or have already put into effect a considerable increase in their water rates in order that they may procure a better supply of water; and gradually we are coming to believe that the water rate, from the standpoint of the consumer, is only a secondary proposition. I firmly believe that before long the proposition of the "free list" in most of our cities will practically be eliminated and every public building and public institution as well as every private building and private institution will pay its proper share for water.
>
> On the cards which I sent out was the question, "What percentage of your total pumpage is furnished free to the city?" and the surprising development came out that some of the cities furnish as high as 30 per cent of their total pumpage to the city for public buildings, parks, etc. On further inquiry I find

that in most of the cases it was a matter of waste; and we are aware that the only way to stop this waste would be to have it understood that each department is to be charged for the water used, and speedily we will see this waste cut down, and then the rates to other consumers throughout the city can be correspondingly reduced.

During 1908 the author collected statistics from practically every city of any size in the United States, and found some of the schedules "would be ludicrous were it not for the fact that in their operation they become a serious problem to the works most interested."

Throughout the U. S. the average rate for family use for a house of six rooms, with hot and cold water in the kitchen, is $6.28; add to this hot and cold water for the bath and for a lavatory and also water for water tray and water-closet, and the average is $13.49; adding to this water for sprinkling the average sized lot—and that happens to be 40 feet—and the average rate is $18.43. The average maximum rate charged for water furnished by meter per thousand gallons is 22 cents and the average minimum rate is 9 cents. Throughout the state of Indiana these rates are somewhat less, being $5.45 for house service; $13.57 for house service, bath, water-closet, etc.; and $18.19 for house service, bath, water-closet and sprinkler.

The record made up from the cards returned by the officials is notable in one instance, that which refers to filtration of water. Throughout the U. S. the records show that only 24 per cent of the municipal plants are furnishing filtered water, while 57 per cent of the privately owned plants are furnishing a filtered supply. According to information, this situation comes about through the fact that, owing to the desire on the part of the municipal departments to reduce water rates, there is not sufficient money at the command of the Water Department to install a filtration system.

Anyone who goes into the question carefully will doubtless be surprised to notice the various rates charged for hydrant rentals in the cities throughout the country. What is supposed to be a fair hydrant rental varies in the cities throughout the country all the way from $8 per hydrant to as high a figure as $79, and the various tabulations as published by different Water Works men show that the average rate is approximately $47. In a recent decision of the Court we find that a reasonable hydrant rental for the city of Omaha was declared to be $60 per year for each hydrant, and the city at this time is paying that rental. I am of the opinion that the important item is not especially the rate of the hydrant, but the important point is to have good hydrants, well located, well taken care of, and to have water at the hydrant of sufficient pressure to take care of the ordinary fire. It is useless to compare the rate charged for a hydrant furnishing service such as that furnished in Chicago with the rate charged for a hydrant furnishing service such as that furnished in Terre Haute or in Richmond. In the last two named towns the fire department depends almost entirely on the hydrant pressure to put out most of the fires, and the fire department in our own city of Indianapolis informs the writer that during the last year 97 per cent of the fires were put out entirely without the aid of the steam engines. In the cities furnishing service like that furnished in Chicago or in Detroit no dependence whatever is placed on hydrant pressure but an expensive Fire Department is kept up and engines respond to every fire alarm and they are depended on entirely in the fighting of all fires.

In further reference to the matter of placing the hydrants, although not directly connected with the question of rates, you doubtless noticed the article which was laid on our desks some few days ago by an Eastern Manufacturer. On his leaflet we were informed that at the Chelsea, Mass., fire the pressure at the end of 900 feet of 2½-inch hose was 47 pounds while the pressure at the engine was 140 pounds, showing a loss of 93 pounds in the 900 feet of hose. Doubtless this particular hose was badly tangled but we notice at each fire like conditions, and this simply calls to mind the importance of having fire hydrants close together where short lines of hose can be used. The tabulation shows that throughout the United States there is on an average one fire hydrant to every 555 feet of mains, and the general tendency at this time is to locate hydrants closer together especially in what is known as the congested district of the town.

The tabulation of rates has been a work of considerable interest, but its chief value to the writer has been to show the great importance of a careful consideration of the existing local conditions before the establishment of water rates.

HOUSE NUMBERING IN LOUISVILLE

The General Council of Louisville, Ky., in June, 1907, passed an ordinance adopting a plan for the renumbering of houses, and this plan is now being carried out. Previous to that there had been much complaint from merchants and others, who were compelled to continually find new addresses, that there was no method by which the location of a house could be approximately determined from the number assigned to it. The new ordinance was drawn up by a committee representing retail and wholesale merchants, physicians, the Post Office Department and the city directory. According to the method adopted, First street is, as before, the dividing line for house numbers on streets running east and west; but Main street now becomes the dividing line for streets running north and south, instead of the river as before. In alloting numbers a new hundred is begun at every intersecting thoroughfare. But the change is made only at thoroughfares, and none is made at the intersections of short streets. The beginning of numbers from a more or less crooked river instead of a straight dividing line had previously resulted in Louisville, as it did in Chicago where the Lake Shore was taken as a base, in great irregularity in the numbering of houses on the streets lying approximately at right angles thereto. In Louisville, for instance, there is only one block between Main street and the river at Fourth street, but there are six or more blocks between Main and the river in other parts of the city.

Contracts for placing the new numbers on houses throughout the city was awarded to F. E. Wagner, of Louisville, and the placing of these is now nearing completion. The work of the contractor is carefully checked by employees of the city. The contract provides that numbers which are affixed to stone, brick or metal must be attached with lead expansion anchors, the use of wooden pegs for this purpose being prohibited.

CLEANING SEWERS IN SAN FRANCISCO

During last December eleven stretches of sewer were cleaned in San Francisco, from which were removed a total of 2,214 cubic yards of silt, the amount from individual sewers varying from 18 to 610 cubic yards. The labor employed included underground men at $5 a day, windlass men at $3 a day and a foreman; also teams for hauling the material to the dump at $5.75 per day. The cost per cubic yard of cleaning and hauling varied from $1.20 to $2.14, the average cost being $1.61. Of this the underground men received about 61½ per cent., the windlass men 17 per cent., the foreman 3½ per cent. and the hauling cost 18 per cent.

ASPHALT TESTING—MELTING POINT

Personal Equation a Large Factor in Making Tests—Melting Poin Indefinite—Apparatus for Thermometer, Kramer and Sarnow, and Howard Tests

By HARRY TIPPER

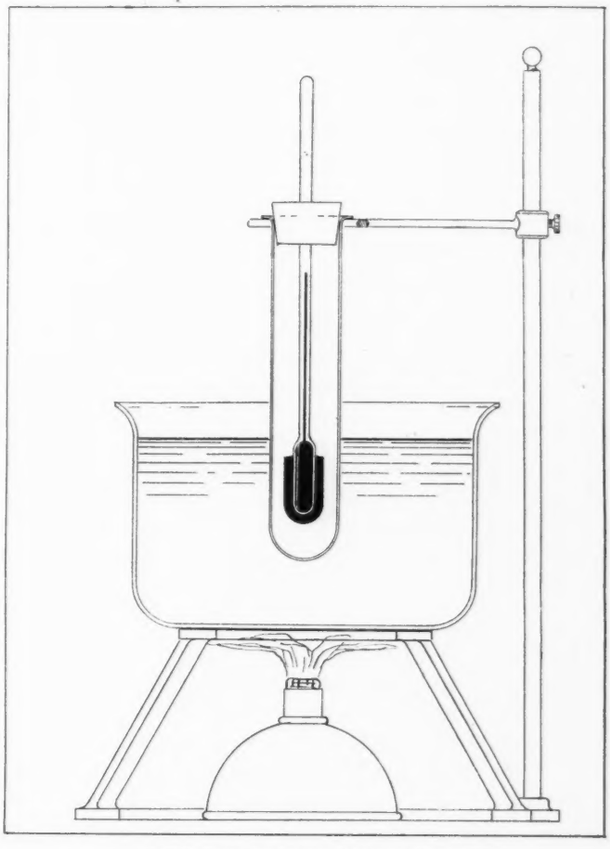
THE testing of asphaltic bitumen for melting point is conducted according to a great variety of methods and produces an equal variety of results. The melting point itself is such an indefinite quantity and can be interpreted within such wide limits that the personal equation is a large factor in the determination, and this in itself is sufficient to cause a considerable variation in the final result. To this indefiniteness is added the fact that a number of methods are employed by different chemists for the purpose of ascertaining this so-called melting point. It is no uncommon thing for the determinations of the melting point of a given asphaltic bitumen, as obtained by different chemists, to vary from each other by 15 or 20 degrees Fahr.

As the temperature of an asphaltic bitumen rises from the point at which it is hard and brittle to that at which it begins to liquefy, the change in its consistency is very gradual. It becomes soft enough to lose somewhat of its solidity and to present a perceptible though slight change in shape under its own weight, at a temperature very much below what has been established by the usual practice of the producer as its melting point. As the temperature rises from this point its softness increases very rapidly; but there is still a considerable range of temperature and of resultant increasing softness within which chemists would differ as to the exact point where liquefaction takes place.

It has been customary in a great many specifications to call for asphalt having a certain melting point; but under the circumstances it seems to be altogether unscientific and outside of what is considered good engineering practice to specify a certain temperature as the melting point of a material, when opinions, methods and results are so variable and no general standard method of test is mentioned or adhered to. There is no method used at present, and there appears to be little probability of developing a method in the future, which will permit the accurate determination of the point at which an asphaltic bitumen changes from solid to liquid. At best this test can be used only as a basis of comparison between one material and another, and it is questionable whether the test has any practical value under these circumstances.

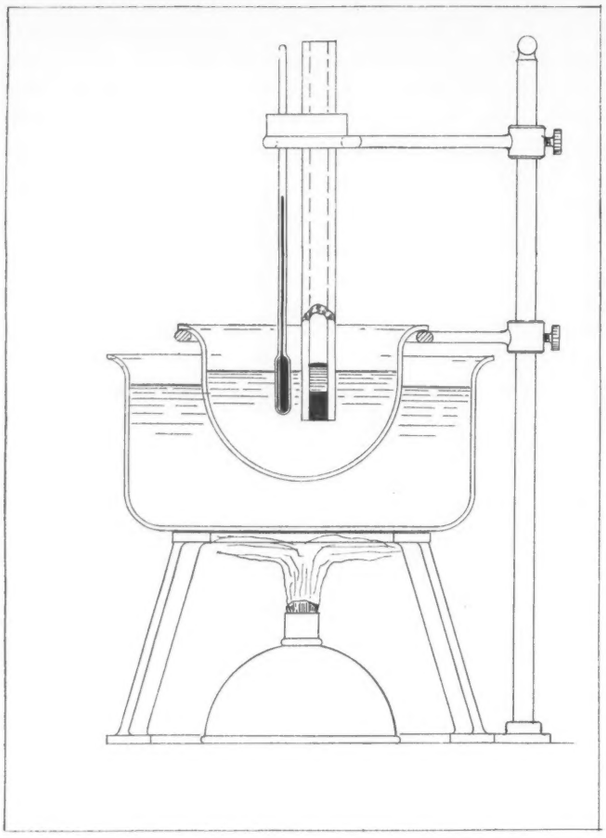
The methods known and used in this country for determining the melting point include the old capillary tube test, the thermometer test, the Kramer and Sarnow method, the Howard test and occasionally other tests not so generally known. The first of these need not be considered here since it has been almost entirely discarded, being found only in certain specifications used in the Middle West. It is, moreover, a very inaccurate method of making the test and varies so much in its results as to be altogether valueless. It is mentioned here only on account of its occasional use in some city specifications for filler asphalt, where newer methods have not yet been adopted.

The thermometer test used by some asphalt producers, while a long step in advance of the capillary tube test, still allows of too much a variation in the result and leaves too much to the discretion of the operator. This test is made by placing a coating of asphalt about one-eighth of an inch thick on the bulb of a thermometer, suspending the same in a test tube and enclosing the whole in a glycerine bath which is then heated slowly. The point at which the coating begins to liquefy is taken as the melting point; but some chemists take the temperature when the first drop falls from the coating, while others take it when the coating begins to pull from the bulb and elongate rapidly. This method still allows personal equation to become a very important factor in the actual result, and the consequent variation is too great to permit it to be adopted as the basis of a general standard.



APPARATUS FOR THERMOMETER TEST

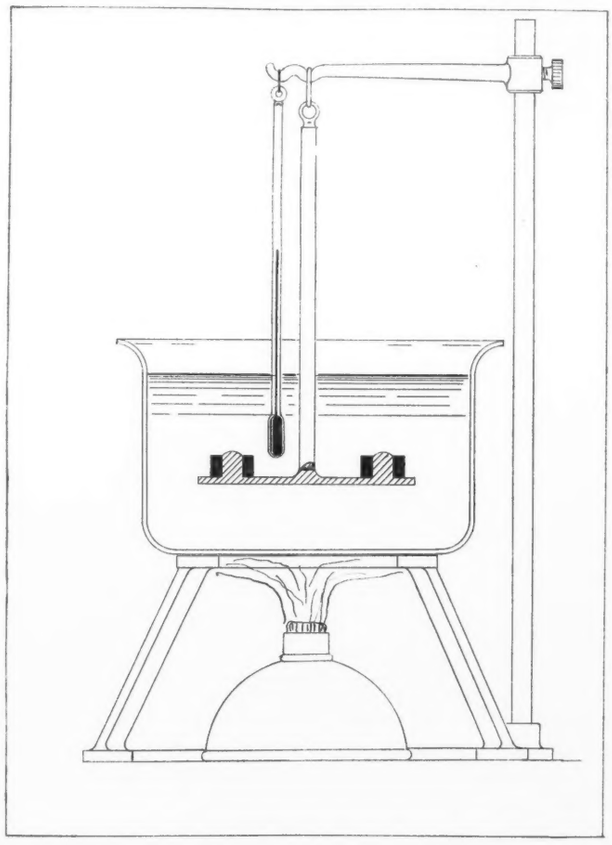
The Kramer and Sarnow test, which is employed by German chemists, is far more satisfactory, the possible variations being confined to much narrower limits and the personal equation being practically eliminated. This test is made as follows: Some asphalt in a layer 10 mm. thick is melted in a beaker in an oil bath. Into this is dipped an open-end glass tube 10 cm. long and 67 mm. internal diameter. The upper end of the tube is closed with the finger, the tube is removed and the asphalt is allowed to solidify in the tube while it is held horizontally and rotated. When the asphalt has set the por-



KRAMER AND SARNOW APPARATUS

tion adhering to the outside is removed. The length of the column inside the tube will be about 5 mm. On top of this is poured five grams of mercury. The tube containing the asphalt and mercury is then suspended in a beaker full of oil or water resting in another beaker also full of oil or water. The inner beaker contains a thermometer, the bulb of which stands at the same level as the asphalt. The outer beaker is heated by means of a small flame, the temperature of the asphalt and thermometer being thus raised slowly and uniformly. The temperature recorded when the mercury falls through the layer of asphalt is taken as the melting point. This method depends for its accuracy as a comparative test upon the diameter of the tube, the thickness of the asphalt and the height of the mercury column; although if a fixed quantity of mercury be taken, a somewhat larger diameter of the tube would be partially compensated for by the resulting smaller height of the column. While this test cannot be considered as absolutely accurate, the results seem to vary within quite narrow limits as compared with many other methods in use.

In the Howard method of testing the melting point of asphalt a plate having two small cylinders raised above its top surface is suspended in a mercury bath; these cylinders having been previously coated with one-eighth inch of asphalt. Both plate and cylinders are completely submerged in the mercury and a thermometer is suspended midway between the cylinders. The mercury is then heated and the temperature at which the asphalt slips from the cylinders and appears on the surface of the mercury is taken as the melting point. There are several points of interest about this test worthy of consideration. The asphalt, being entirely submerged in the mercury, cannot be seen at all during the heating, nor until it has actually left the cylinders and floated to the surface. Being very much lighter than mercury it will rise immediately when the softening has reached the point where the adhesive effect of the asphalt becomes less than its buoyancy. Since the asphalt cannot be seen at all until it actually appears floating, there can be no possible difference of opinion as to the time when the thermometer reading should be taken; and the difference in specific gravity of the asphalt and mercury is so great that its coming to the surface is instantaneous.



HOWARD STANDARD TEST

In addition to the above tests a number of others are used more or less frequently for the same purpose, some of which present points of interest with reference to the limits of variation and the accuracy of comparison. One of these is a modification of the thermometer test, in which a platinum cup filled with asphalt and having a hole in the center of its bottom is suspended in a test tube together with a thermometer, the whole being suspended in a bath and heated slowly; the melting point being taken as the temperature at which a drop of the material comes through the hole in the bottom of the platinum cup. This method has been found to give results varying not more than two or three degrees from each other, and as a basis for comparison would appear to be a simple and efficient method.

The value of a melting point test in relation to the

commercial uses of the material depends largely upon the standardization of this test, upon the accuracy of the method employed and the purpose for which the asphaltic material is to be used. To discuss these matters in a proper fashion will require sufficient space to warrant considering them in another article, and the next article of this series will be devoted to that consideration.

SEWAGE DISPOSAL IN PENNSYLVANIA

As indicated from time to time in our columns, the matter of sewage disposal is just now assuming more importance in Pennsylvania than in possibly any other State of the Union, this being due largely to the activity of the new State Board of Health under the recent laws endowing it with unusual powers. Two of the latest propositions as well as the largest are those which are ordered for the cities of Harrisburg and Pittsburg. The public press of the former city states that the city officials are about to begin at once preparing plans for works which are roughly estimated to cost one and a half to two million dollars. This does not contemplate the present treatment of the sewage of that city, but only a better location of outlets and the preparation of plans for treatment. Pittsburg, however, is directed to take immediate steps toward building a sewage disposal plant which is estimated to cost fifteen to twenty million dollars; this order possibly being hastened by the typhoid epidemic which is sweeping through the small towns located on the river below Pittsburg.

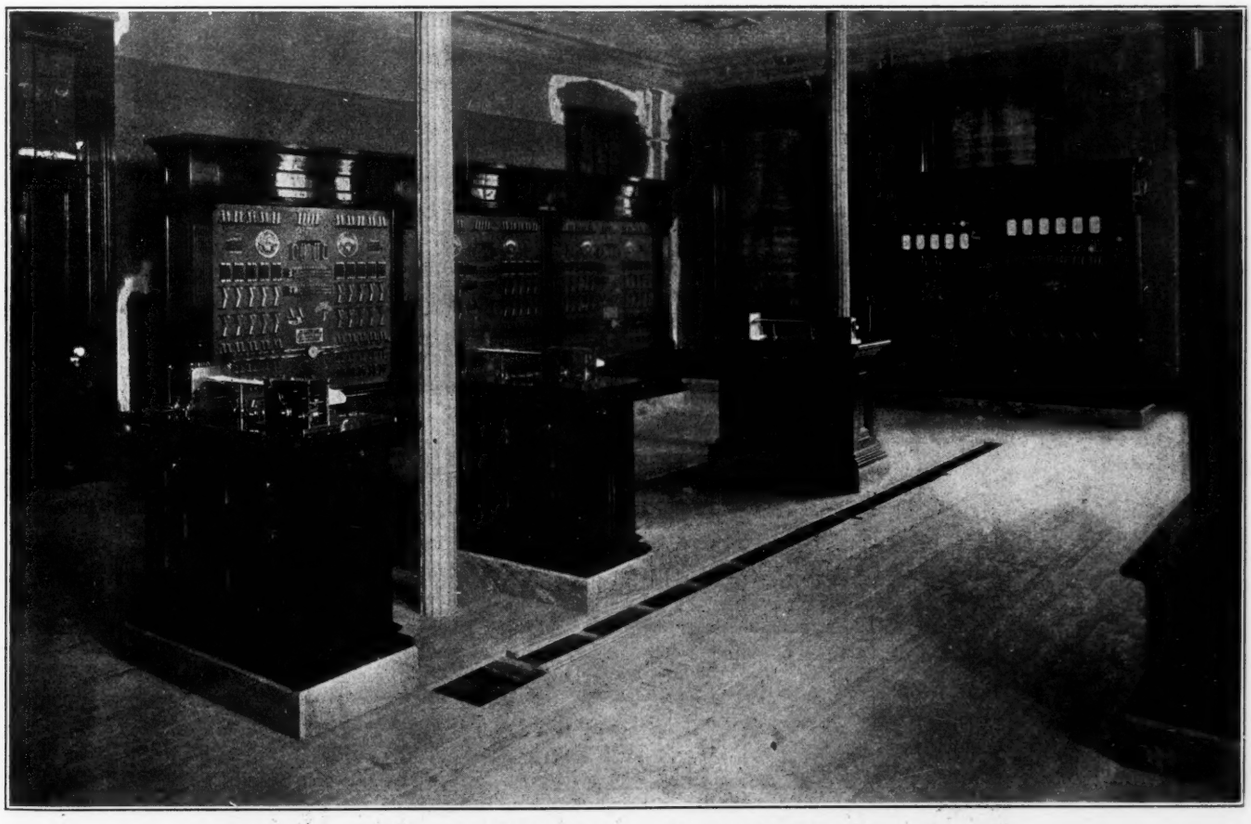
ALBANY'S FIRE ALARM EQUIPMENT

Recently Completed Central Office Equipment of Fire Department—General Description—Technical Description by National Board of Fire Underwriters

THE new Fire Alarm Office of the Albany, N. Y., Fire Department is equipped with a very complete and up-to-date set of instruments for receiving, indicating, sounding, recording and sending out fire alarms; the various parts being so related to each other as to provide at least two, and in some instances five, alternative methods of accomplishing every important result.

When a street box is set in motion by a citizen, its number is recorded automatically on a paper tape, and while this record is being made a bell sounds the box number, and an incandescent lamp on the switchboard indicates the number by a red flash for each stroke of the signal.

The number of the box from which the alarm is sent is repeated at least four times in this way, and provision is made on the switchboard so that, as soon as the number has been repeated once to warn the operator on duty, he can, by moving a single switch, bring the box circuit from which the alarm is coming into communication with all the fire houses, so that the box number is automatically transmitted from the street box to suitable registers and small gongs in all the fire department houses.



ALBANY FIRE ALARM INSTALLATION

Storage switchboard along further wall; Joker and Gong switchboard at right end of room. Corner of Relay switchboard at extreme right of picture.

A "Joker Transmitter" is provided for repeating the alarm from any of the box circuits to all the "joker" or indicator circuits. This transmitter is capable of being manually set to send any box number from 1 to 9999. It is used for taking care of alarms and special calls received by telephone, also in case the box circuit wires are partially disabled, so that the signal, as received, is not clear enough and might be misunderstood by the firemen on duty at the various houses, when it is verified by the operator from a list of numbers immediately above the red light for each circuit on the box circuit switchboard.

There are at present ten box circuits in use, but the new system provides for a total of twenty box circuits which will permit some of the present circuits to be divided and relieve their present overloaded condition which has resulted from the growth of the city since the old system was installed. These extra circuits also provide a margin to accommodate the future growth of the city.

Each of the twenty box circuits is provided with a set of relays, switches, spring jacks, box lists, and tap bell, the bells of various circuits being tuned for different notes, so as to facilitate counting the signal from any one circuit if alarms should be striking on several circuits at once.

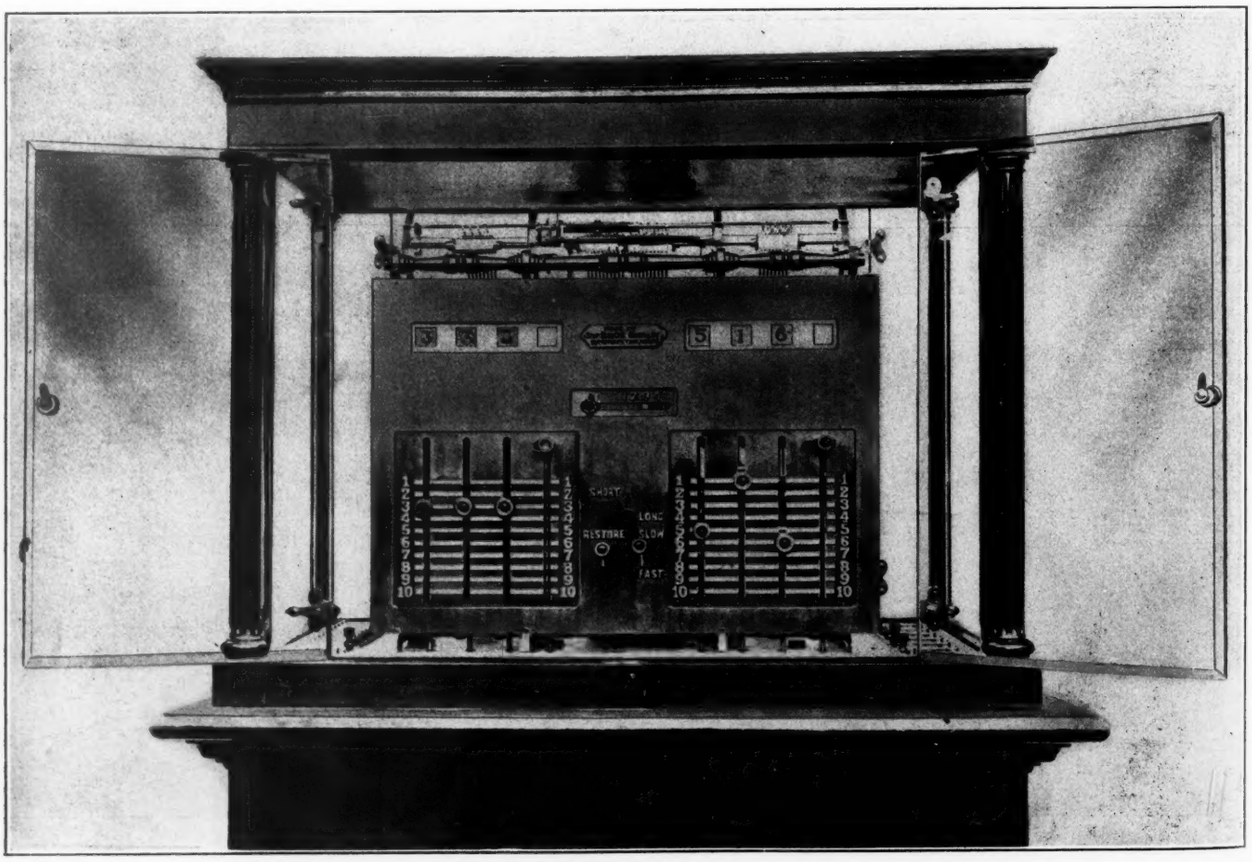
A large two-dial manual transmitter stands in the center of the room, each of its dials built of five plates, and so arranged that it can be set for any signal from 1 to 9999; or, by using the ten stroke position, any signal to 10,999 can be sent from either dial, besides various combination signals made up partly on one dial and partly on the other. The claim is made for these transmitters that they are so built as to admit of unusually quick setting.

The manual transmitter may be set to run "fast" or "slow," and may be connected to either the joker or gong circuits, being ordinarily set for slow speed and connected to the gong circuits so as to sound the large gongs in the steamer and truck houses, as well as the big bells in the City Hall tower and various church steeples used to sound public alarm.

The transmitters are operated by heavy cast-iron weights, electric motors being arranged to keep them automatically wound up, but a hand wind is also provided for use in the event of failure of the electric light current to operate the motor. After the manual transmitter has been set in motion it will automatically stop itself and restore all the signal levers to their normal position provided a little knob has been set to "restore"; otherwise the signal set up will not be disturbed when the machine stops, so as to be ready for use in connection with any special call which may be received.

Automatic registers are conveniently mounted on each side of the manual transmitter, which record all incoming alarms by heavy ink marks on a wide paper tape, convenient for the use of the operator when sending out alarms; and another register records outgoing signals.

The transmitters and registers are mounted on highly

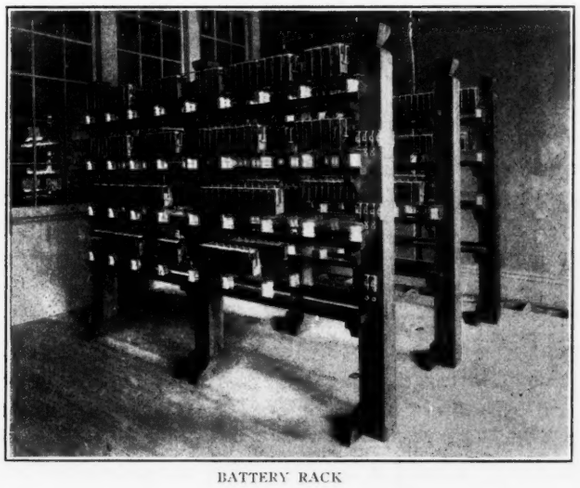


MANUAL TRANSMITTER

finished solid mahogany stands with red marble base boards, and the mechanism of the transmitters is enclosed in polished and beveled plate glass cases, built with carved mahogany posts.

The switchboards for the gong and joker circuits are provided with instruments for indicating each stroke of every signal as it is sent out on each circuit by means of targets and colored lights. A break in any of these lines is instantly shown and an alarm bell is sounded to direct the attention of the operator to any such defect in the outside lines. Telegraph keys are provided for each gong and joker circuit, also master keys for all the gongs and for all the joker circuits, so that the signals may be transmitted on either individual circuits or all at once by pressing the various keys.

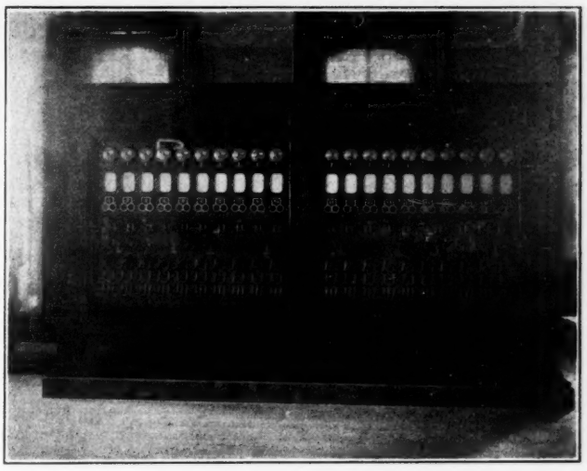
Along the entire west side of the room is the storage battery regulating and distributing switchboard, arranged to regulate and control the batteries which supply the energy to all the circuits. This switchboard has fuses, switches and instruments arranged to protect the batteries from "overload," reversed current, etc.; also switches dividing the batteries so that while one group is supplying the various circuits, another group containing an equal number of cells is held in reverse. All the circuits may be accurately measured and tested from the storage board, and the rate of recharge may be regulated and measured as desired.



BATTERY RACK

The storage batteries, in a room adjoining the main operating room, are neatly mounted on glass strips, carried by porcelain insulators on wood racks, each cell having a neat cover. A protector board provides fuses and lightning arresters where the circuits leave the operating room, and has complete testing and grounding facilities for each line. All wiring is run from one point to another in metal tubes placed under the floor.

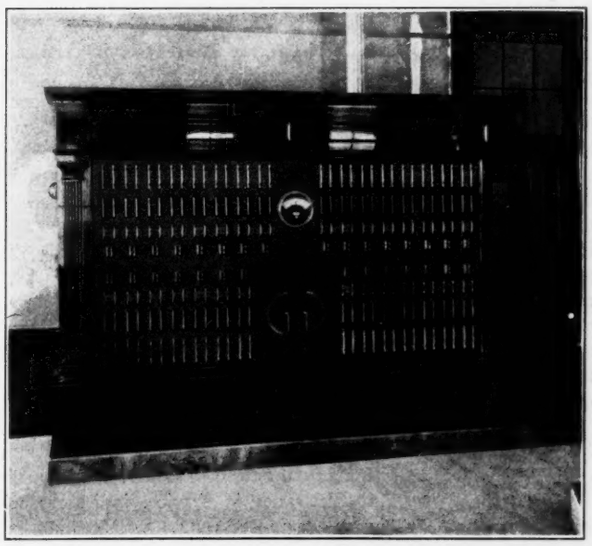
This new system was selected last year by the Board of Contract and Supply of the city, after an examination of representative systems in Cleveland, O., Boston, Mass., and Syracuse, N. Y., which points were visited by Mayor Gaus and Commissioner Cantine, prior to the award of the contract for this work. The contract price for the new system was $16,997, the entire equipment being designed and built by the Star Electric Company of Binghamton, N. Y.



RELAY SWITCHBOARD

In a report made last December by the Committee on Fire Protection of the National Board of Fire Underwriters (a previous report was made by the same Committee in 1904), the fire alarm system is described technically as follows:

The force is under the same supervision and management as in 1904. No increase in membership. The Star Electric Company has installed new central office apparatus in the old headquarters; the former apparatus is held in reserve. The new office was placed in operation in November. The office is in a building of ordinary construction with no internal protection, hazardous electric light wiring and serious exposures, but as an adjacent building was once burned without destroying the fire alarm office, the department considers the hazard of little moment. The new apparatus at headquarters includes a 30-circuit protector board, a 20-circuit box relay board, an alarm board for 5 joker and 6 gong circuits and three 10-circuit battery charging boards, all of slate; also a two-dial, 4-figure, two-speed, manual transmitter; a one-dial, 4-figure joker transmitter; two 10-pen tape registers for box circuits; a 5-pen tape register for joker circuits and an electric clock. A telephone switchboard, similar to the one now in use, is to be placed in the new office. Slate distributing boards are located in attic and cellar, where wire or cables enter building. Circuits are protected by 3-ampere fuses in glass, improved choke-coil arresters and ¼-ampere heat coils on the protector board and by 6-ampere fuses at junction of underground and overhead lines.



PROTECTOR SWITCHBOARD

Instruments are protected by 5-ampere cartridge fuses on line side of lamp and register circuits, ½-ampere cartridge fuses on line side of other circuits, 3-ampere cartridge fuses on charging side of operating circuits and 6-ampere cartridge fuses on charging circuit, all on charging boards, and batteries are protected by 3-ampere cartridge fuses on the battery racks. All fuses have snap connections, and are so arranged as to insure safety to the operator in making changes or connections.

Each box circuit is provided with plugs for putting any two circuits in series or for increasing current on a weak circuit; also with relay and switch, Morse key and switch, 3-position register switch (for operating with open or closed circuit), a red light for open circuits, a white shutter to indicate if circuit is operating automatically through the joker transmitter, a box list and a tap bell and switch. A gang switch is arranged to throw any circuit to transmit automatically through the joker transmitter, at the same time locking out other circuits.

Each joker (indicator) circuit is provided with plugs for throwing any two circuits in series, switches for connecting to either joker or manual transmitter, a relay and switch, Morse key and switch, 3-position register switch, engine house list and a target normally black and showing white when circuit opens. A continuous-ringing bell is arranged to strike when any circuit opens and a multiple key is provided for manual transmission. Each gong circuit is provided with rheostats for varying line resistance, switches for manual transmitter, single and multiple keys, shutters and bell, a Morse key, a shutter showing black when weak reverse current is closed, and white when line opens, a green light showing when main circuit closes and a fire house list. A bell is arranged to ring at closing of any circuit, and a multiple (Morse) key, arranged to close circuits successively, is provided for manual transmission.

Incoming alarms operate a relay, red light, tapper and pen register. Outgoing alarms operate, on joker circuits, a relay, white target, bell and pen register, and, on gong circuits, a green light and bell.

Registers are of an improved type with several novel features. The manual transmitter is arranged to operate either gong or joker circuits as desired, will restore to normal position either manually or automatically, and will transmit one signal of from 1 to 8 figures or two signals of from 1 to 4 figures. The joker transmitter operates normally from the manual transmitter or may be operated direct manually.

The transmitters and registers are provided with automatic motor winders or may be wound manually.

Battery charging boards are of a new type, and, in addition to the usual functions of such apparatus, display numerous special features, all calculated to assist in the quick and safe operation of the system.

Batteries are of the chloride accumulator type, in duplicate, well mounted on glass on porcelain insulators on wooden racks in a well-ventilated room. Cells have about 10-ampere-hours capacity at normal discharge (or about 4 days for each battery) and 582 are installed at present. An instantaneous water heater and a still are provided. At present a Steinmetz mercury rectifier is in use for adapting the 110-volt A. C. lamp circuit to charging batteries, but the department will install Holtzer-Cabot motor generators in duplicate for this purpose. Operating room cases and pedestals are of mahogany. Headquarters wiring is of No. 14 and No. 16 copper with okonite insulation, carried in flexible duct or conduit under floors, etc. Wiring on switchboards and to instruments is of superior quality and in general the workmanship is excellent.

Apparatus at houses is the same as in 1904, except that a bell is connected on the indicator circuit at each house, and most of the houses have telephones on the fire department circuits. When the new central office goes in service, indicators will operate on closed centrally energized circuits and all gongs on open circuits with a normal weak current for testing. The superintendent has recommended replacing the indicators, which are of antiquated type, by modern stamp registers at each house.

There are now in service 169 public and 4 private boxes, an increase of 11 since 1904. The old boxes of 1887 are still in service. Recent installations are of the improved Pearce and Jones type, positive acting, but without non-interference mechanism; two Gamewell "Nonpareil" boxes are in service. All boxes have keys attached. Last general painting was in 1905, and many boxes are dingy and inconspicuously located. Box distribution is good, except in a few outlying recently built-up sections.

The same circuits are in use as in 1904, with extensions for the additional boxes. An inspection of several miles of the lines showed numerous defects, circuits being at many points on poles with high-tension street light circuits or with trolley feeders, wiring on box poles being generally poor and circuits being carried on house tops and through trees without special precautions. Wiring in several of the older houses is of inferior type. Boxes in the underground district are connected overhead to the nearest distributing pole. The department uses wires in the telephone cables for underground work, which has caused considerable trouble in the past, but is considering installing its own cables. The superintendent has recommended a type of cable which in other places, notably New York City, has been found unreliable.

The department telephone system is about as in 1904. A new switchboard will be installed.

Only one operator is constantly on duty at headquarters. Tests are regularly made, boxes being tested monthly by sending in an alarm to headquarters preceded by a special signal. A suitable large scale map, showing the location of all boxes, circuits and underground terminals, is nearly completed. Records are made of routine tests, but are not tabulated.

UNDERGROUND SPRINKLING FILTERS

The suggestion of Mr. H. W. Clark, made in the paper abstracted in our issue of January 27, that sprinkling filters in this country might later on be covered to permit the use more advantageously of sewage distributors, was dissented from by some of those present at the meeting where this paper was read, chiefly because of the great expense involved. We wonder what the same gentlemen would say to a recently suggested plan presented by a firm of engineers of wide reputation in which it is suggested that New York city might place sprinkling filters under the streets of the city; these to be furnished for the purification of the effluent from screens and settling tanks, which likewise would be beneath the roadway. The whole proposition might seem somewhat visionary, the plan suggested being to treat the sewage from practically the entire population of Manhattan Island in plants beneath the street surface, these to include, besides the above, pumping plants, sludge presses, etc. The expense of this would, of course, be enormous, being estimated at $15 per capita of those contributing sewage to the plants. Whether or not this would be cheaper than carrying the sewage by inverted siphons under the Hudson or East River and for several miles back therefrom to available lands not already populated and the establishment of plants above the surface at those points, is a matter concerning which the report was silent. It is not, we believe, at all probable that the proposed scheme will be adopted at present, or at any time before a definite comparison of these two and possibly other alternatives have been carefully made.

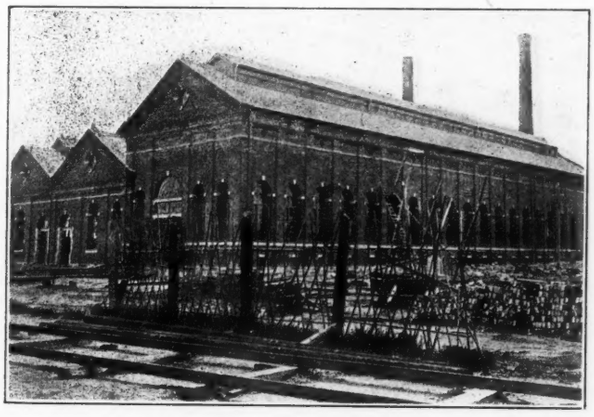
MUNICIPAL ELECTRIC ROAD OF OSAKA

Only Municipally Owned Street Railway in Japan—Twenty-Two Miles of Single Track and One Hundred Cars —Other Municipal Enterprises

By YOSHIO KATAGIRI

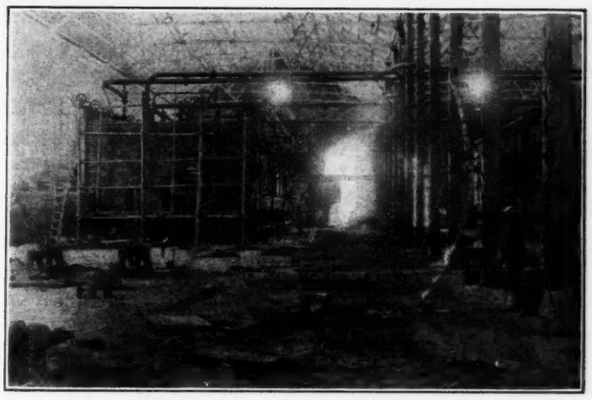
The following article, sent us by a subscriber in Japan, is printed exactly as written by him, and is interesting, not only for the information conveyed, but also for the excellent English used.

It is a little strange that there are many people in America who have never heard of Osaka, but have heard much in regard to Tokyo, Kyoto or Yokohama. Nevertheless, Osaka, with 1,170,000 inhabitants, is the second largest city in Japan, and moreover the city can well boast of the fact that it occupies a unique position in the industrial and commercial sphere of the empire. The pride of the city does not stop here, for it has the honor to be the only municipality in Japan which owns and operates the street railway system, and the first one to receive percentage of the gross receipts from the gas, electric lighting and ferry boat companies.

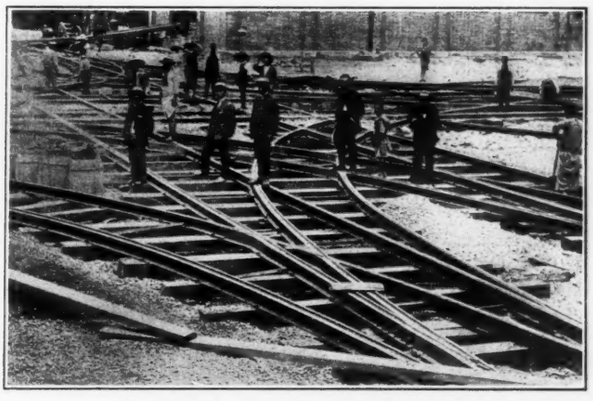


OSAKA MUNICIPAL POWER STATION

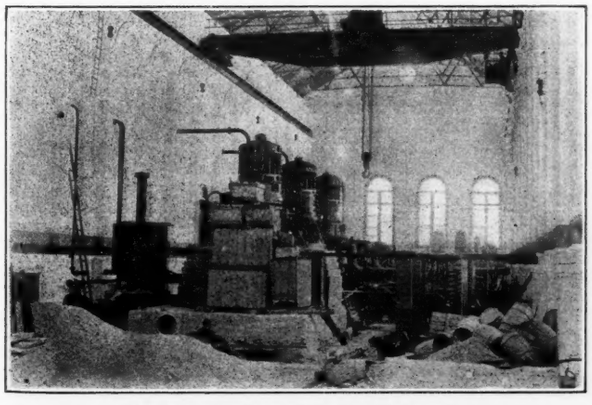
On September 1, 1903, the first municipal electric line between the new harbor and the west end of the city, comprising a length of three miles, was opened. The system was built as an adjunct work of the harbor construction, for the harbor lay far from the main city. In November, the same year, the city Council passed unanimously a remarkable resolution that all the street railways in Osaka that should be laid in the future should be built by the municipality itself and in December the city authority prepared a comprehensive scheme for the building of a power station and the new lines. The scheme was embodied in an act obtained in July, 1905, which authorized eight miles of double track. In July, 1908, the construction, except a few short lines, was completed, and the old line was also made a double track at the same time, so that the total length of the whole system amounted to what would be the same as 22 miles of single track. On August 1, the cars ran on these lines and very soon the success of the new system was fully demonstrated. The traffic earnings for three months ending October 31 amounted to $111,528, while the expenditure to $35,735, leaving the net profit of $75,793. On November 1, the capital expenditure stood at $2,559,013. Since November 1, when the said short lines were finished, the traffic receipts have gone rapidly forward; the earnings for the month



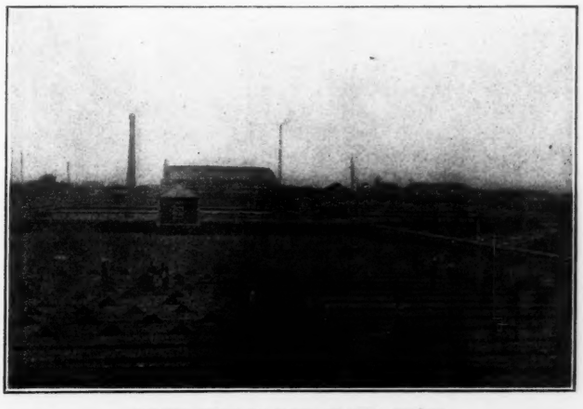
BOILER ROOM OF POWER STATION



"DIAMOND" CROSSING AT YATSUBASHI



STEAM TURBINE IN POWER STATION



FILTER BEDS OF CITY WATER WORKS

amount to $455,640, exhibiting an increase of $83,877, compared with the average monthly earnings for the previous three months.

At present the corporation owns 100 cars, of which about 70 cars are used daily, each car running an average of 97 miles.

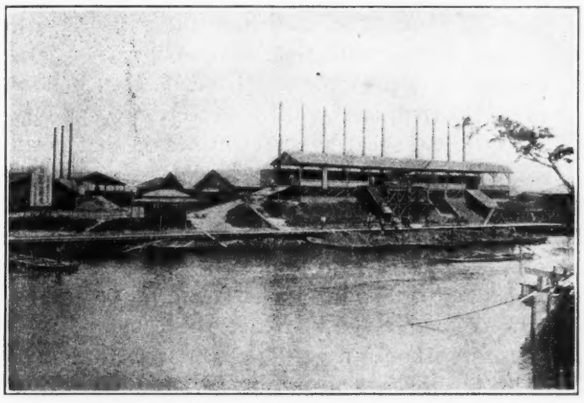
The tramway charges fares of from one cent up to five cents according to distance, and workmen's tickets,

MAP OF OSAKA, SHOWING ROUTES OF STREET RAILWAY

half-priced, are issued on all cars up to 7 a. m. The current is being supplied from the corporation's newly-erected power station, which has sufficient capacity to supply power also to the Osaka electric lighting company up to 1000 k. w. Within a few years the municipality will have additional lines of 68 miles.

Enterprises which have been carried out by the municipality are as follows:

	Cost.	Year of completion.
Harbor construction	$11,430,119	1905
Water works	1,711,635	1895
Sewers reconstruction	524,602	1897



GARBAGE INCINERATING STATION

The municipality supports the higher commercial school, the technological school and the school for blind and dumb with its own fund. It owns three crematoriums and cemeteries, a garbage incinerating station, infectious disease hospitals, a hygienic laboratory, parks and ferry boats.

CITY ACCOUNTING IN MASSACHUSETTS

FROM the annual report submitted to the Legislature a few days ago by Charles F. Gettemy, Chief of the Bureau of Statistics and Labor of Massachusetts, it appears that the matter of improved and uniform city accounting methods is making gradual but appreciable advance in that State. The cities of Cambridge, Newton, Holyoke, New Bedford, Lowell and Everett have adopted the principle of the standard schedule, by ordinance or the initiative of accounting officers, and Gloucester's new council has just adopted the recommendations of the Bureau. Public opinion concerning this matter has been so generally aroused that Mr. Gettemy does not ask for any further authority to compel the more general adoption of standard methods, believing that "it is only a matter of time when other municipalities will see the advantages of adopting standard classifications and a uniform terminology in the treatment of their finance." He recommends, however, that the various towns be required to adopt a uniform fiscal year. He suggests that with an appropriation permitting an increase in the force, the Statistics Division could be of great service in collecting and tabulating data concerning the finances of Massachusetts cities and furnish such information as well as advice to other cities of the State, to assist them in formulating approved methods of accounting.

HOUSE NUMBERING IN CHICAGO

New System to Take Effect Next September—A North and South and an East and West Base Line—Method of Notifying Owners

Like all large cities that have grown rapidly and absorbed nearby villages, Chicago has had considerable confusion in its house numbering and street nomenclature. In 1907 a committee of council asked John D. Riley, Superintendent of Maps, to prepare a report on this matter and submit it with his recommendations to Council. This report was submitted on October 21, 1907, and after considerable discussion and some changes, the following ordinance was passed by Council, June, 22, 1908:

AN ORDINANCE

To provide for the numbering of lots or houses in the City of Chicago.

Be it ordained by the City Council of the City of Chicago:

SECTION 1. That it is hereby made the duty of the owner, agent or person in possession of every building in the City of Chicago, to number it in the manner herein provided.

SECTION 2. All lots or houses located on the north and south streets or on streets running in a northerly or southerly direction, excepting as hereinafter provided, shall be numbered from Madison street as a base line beginning with Number 1 at the north line of Madison street and increasing towards the north and beginning with Number 1 at the south line of Madison street and increasing towards the south. All north and south thoroughfares lying north of Madison street, excepting those in the territory described in Section 5 of this ordinance, shall bear the prefix "North."

SECTION 3. All lots or houses located on east and west streets or on streets running in an easterly or westerly direction, excepting as hereinafter provided, shall be numbered from State street and a continuation of the line of State street in a northerly direction as a base line, beginning with Number 1 at the east line of State street and increasing towards the east and beginning with Number 1 at the west line of State street and increasing towards the west. All east and west thoroughfares lying east of State street, except those in the territory described in Section 5 of this ordinance, shall bear the prefix "East."

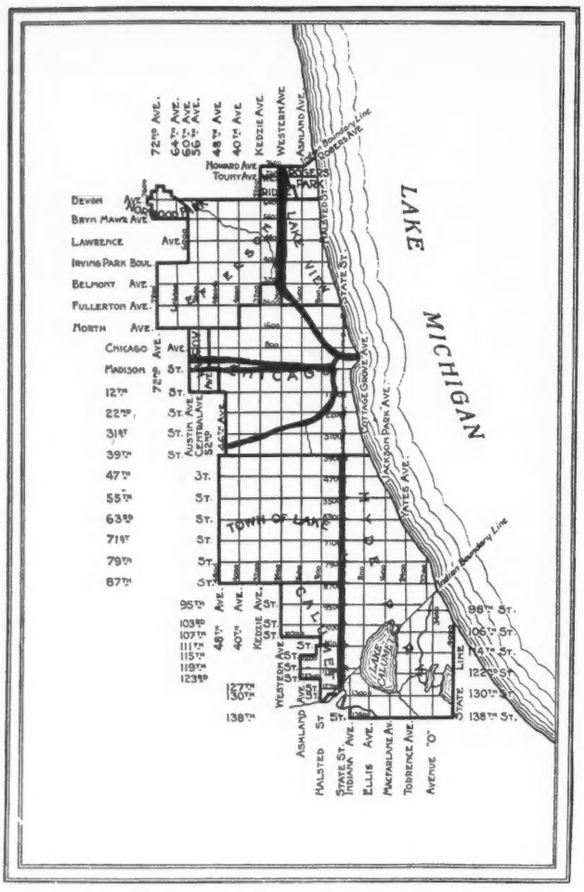
SECTION 4. There shall be assigned to each mile eight hundred (800) numbers, or one hundred (100) numbers to each one-eighth of a mile on all streets and such numbers shall change from one one hundred to the succeeding one hundred at the intersecting street nearest the said one-eighth of a mile line, excepting on those street included within the territory described in Section 5 of this ordinance and excepting on all north and south streets between Madison street on the north and 31st street on the south, in which territory there shall be assigned twelve hundred (1200) numbers between Madison street and 12th street, one thousand (1000) numbers between 12th street and 22nd street and nine hundred (900) numbers between 22nd street and 31st street. The even numbers on north and south streets or streets running in a northerly or southerly direction, shall be on the west side of said streets. The even numbers on east and west streets, or streets running in an easterly or westerly direction, shall be on the north side of said streets.

SECTION 5. The numbers heretofore assigned to the lots or houses in the territory bounded by the main branch of the Chicago River on the north, the south branch of the Chicago River on the west, 12th street on the south and Lake Michigan on the east, shall remain unchanged.

SECTION 6. Sections 2115, 2116, 2117 and 2118 of the Revised Municipal Code of Chicago of 1905, together with all ordinances or parts of ordinances inconsistent with or contrary to this ordinance, are hereby repealed.

SECTION 7. This ordinance shall be in full force and effect from and after September 1, 1909.

As will be seen by the accompanying map, State street and its continuation in Lake Michigan was established as a base line for east and west streets, and Madison street as a base for north and south streets. At present most east and west streets start numbering at the lake and consequently the numbers in one block on a street do not necessarily correspond with those of a similar block in a parallel street.



CHICAGO, SHOWING NUMBERING BASE LINES

New base lines follow State and Madison streets. Other heavy lines are old base lines.

In 1895 Council passed a general ordinance which changed the names of all north and south streets from Crawford avenue west to the western limits of the city to numbered avenues and courts. State street and 800 numbers to the mile were used as the basis of determining the numbers to be used. Crawford avenue being five miles from State street became Fortieth avenue, and the east and west streets were numbered accordingly. Also on the south side of Chicago the numbered street system is used for east and west streets and the houses on the north and south streets are numbered to correspond with the street intersections. Eight hundred numbers to the mile is also the basis of the numbering here, except as noted in the ordinance, where 900, 1,000 or 1,200 have been used, and which it is not proposed to change. To obtain the advantage of the uniform numbering prescribed by the ordinance will cause comparatively little trouble. "No change of numbering is required on north and south streets in the entire portion of the city lying between the south branch of the river and the southern limits of the city, which comprises practically 60 per cent. of the entire area. Very little change is required in that section of the city known as Austin. One change, however, would have to be made on all east and west streets south of Thirty-ninth street and west of State street. These streets, as at present numbered, conform to the proposed system of 800 numbers to the mile or 100 numbers to the 600-foot block and are numbered west from State street, but for some unaccountable reason instead of commencing with zero they commence at 100. This makes the number at say Forty-seventh street and Fortieth avenue 4100 instead of 4000. which latter would agree with the name of Fortieth avenue. The new system would necessitate the change of only one figure in the existing house numbers."

The ordinance also states that the portion of east and west streets lying east of State street shall have the prefix "East," while that part lying west shall have no prefix, as the distinction is sufficient without it. Similarly that portion of north and south streets lying north of Madison street shall have the prefix "North" while those to the south shall have no prefix.

The report also recommends that certain street names be changed, and states that there are 478 duplicate street names; that 37 street names, in that portion of the city formerly Austin, should be changed to conform with names of their continuations in the original city; that 11 street names should be changed to conform with correct names of their continuations as established by ordinance January 14, 1895; and that disconnected streets on the same line, but with different names, should have the same name throughout.

While this change in the numbering system did not mean a great deal to the inhabitants of Chicago as a whole, it did entail a very considerable amount of work on the map department. The usual lot width is twenty-five feet, and the house numbers shown on the maps were on this basis. The provisions of the ordinance give about twenty feet for each number, and this was made the official lot width. Consequently all the maps had to be changed to correspond. At present the work is partially completed and it is hoped to have it entirely completed by April 1 for reasons given later.

The question came up as to how to notify house owners and users of the proper numbers of their places. To obtain the name of the owner and description of the property in the usual way would have required the services of a large force of men for several years in looking up the records, to say nothing of the cash outlay for postage, etc., which would amount to some $5,000. The total expense would probably be close to $50,000 for this method. It was then suggested that on a certain day each householder be notified of the official number of his place by the patrolman on the beat who would previously have been instructed. But the device finally adopted was to work in conjunction with the water department. The books of this department show the location of the property and name of the owner and occupant. When the bills for water are sent out, between March 1 and June 1, each will have the new official number of the house on it and a notice will be enclosed telling the recipient to have the number changed to correspond by September 1, 1909. In this way there will be comparatively little expense, and the notification will get into the proper hands.

After the renumbering a house number and street name will indicate its exact location in 75 per cent. of the area of the city, and the location in one direction in the remaining 25 per cent.

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FEBRUARY 3, 1909

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Water Meters and Public Health

THE Mayor of one of our large cities has refused to comply with a State law requiring the gradual installing of water meters, giving as his reason his opinion—which he sets up in opposition to that of engineers who have investigated the conditions—that "the waste of water to-day (which is estimated to amount to sixty gallons per capita) is not from open taps but from breaks in the pipes caused either by their age or electrolysis." He further says of the meter: "I have fears of the danger to public health apt to result from its installation in the tenement house. There are so many possibilities of its being used as a means of oppression that I am inclined to hold back."

These same arguments have been proved utterly without foundation by scores of cities, both the largest and the smallest; and to an executive who reaches conclusions contrary to experience and to expert knowledge, by reasoning based on false premises and ignorance of conditions, it should at least be suggested that he "stick to his last." There may be arguments adducible against the advisability of adopting meters, some general and others of special application; but danger to public health has absolutely no standing as such, if the rates are fixed on a common-sense basis, as they are in all cases within our knowledge. In the case of many small supplies, especially gravity ones, the value of the water wasted may be less than the cost of meters. In other cities the citizens may have been educated to avoid waste, and periodical inspection of fixtures may reduce leakage from these to a minimum. But the "public health," "flushing the sewers" and "water should be free as air" arguments were long ago shown to be fallacious.

Keep Records of Municipal Construction

IN our December 30 number we called attention to the fact that Bridgeport, Conn., realized the importance both of having up-to-date maps and records of the city, and of keeping a permanent city engineering force and keeping it occupied. This week we refer, on page 183, to similar wisdom on the part of Altoona, Pa. Most City Engineers feel quite strongly the need of keeping complete records of all work; but too many find this impossible because of insufficient time and assistance. For such as are fortunate enough to have these, and to furnish an incentive for others to urgently request them, we presented last week two methods of keeping records, one by the card index, the other by a street atlas, which contain many suggestions. Water Works Superintendents also will find the employment of the second method for recording the location and changes in mains, valves, etc., of the greatest assistance.

Prompt Municipal Report

WE take pleasure in adding to our roll of honor for promptness in publishing reports, the Board of Water Commissioners of Atlantic City, N. J. On January 21 we received their annual report for the year ending January 1. We believe this is the record for promptness.

CONCRETE VS. BRICK AND PIPE SEWERS

Report of Committee on Sewers of the Illinois Society of Engineers and Surveyors—Concrete Cheaper than Brick—Little Actual Competition with Pipe

THE perceptible changes in sewer construction have for the past few years been very slight, with a tendency toward the use of concrete, both plain and reinforced, in the place of brick and the larger sizes of vitrified tile pipes.

The City of Chicago was one of the first cities in the State to build a system of concrete sewers. Cairo, Decatur and Elgin have each a system of concrete trunk sewers; East St. Louis has a similar system in contemplation. The concrete system for all large storm or combined sewers has become a factor which will soon occupy first place, if indeed it cannot be conceded that position now.

Several papers have appeared since concrete-sewer construction has come into more popular practice under such general titles as "Concrete *vs.* Vitrified Sewer Pipe" and "Concrete *vs.* Bricks for Sewer Construction," all of which are evidently intended to discourage the use of concrete for sewers.

Taking up the articles under the first head, "Concrete *vs.* Vitrified Tile Pipes," we feel the zeal of the authors has allowed them to carry a comparison too far. Few concrete sewers have been constructed less than thirty-six to forty inches in diameter, which are the largest sizes of tile pipe. The two methods of sewer construction touch at but one point, and that point may be considered an extreme in both—the maximum diameter for pipes and the minimum for concrete. The most serious point raised against the use of concrete for sewers is the so-called disintegration of concrete claimed to be due to acids in sewage or formed from gases thrown off by septic action. The citations where concrete sewers have apparently disintegrated are scattered and few, the principal ones being Brooklyn, N. Y.; Oshkosh, Wis., and San Francisco, Cal. Sewage to contain an objectionable amount of acid would of necessity be such as is found only in sanitary sewerage systems or the waste water from industrial plants where acids may be used. As yet the general practice for concrete sewers is their use for storm or combined systems. Lastly the acid reaction upon concrete has not been proven to be detrimental to any great extent, not as much to be feared as the alkalies of the arid regions of the West. Again if the action of the sewage will disintegrate the shell of a concrete sewer it will prove equally as detrimental to the mortar joints of pipe sewers. We need feel no uneasiness on account of the stability of either construction when conditions are normal, but the field of usefulness for each is so clearly defined and different that the trend of practice does not look toward the displacement of either method with the other.

In "Concrete *vs.* Bricks for Sewer Construction" many points appear for comparison, and apparently the only field that concrete enters as a competitor in sewer construction is that of brick. In comparing the two the question of any disintegration is practically eliminated as the chemical reaction of any solvents in sewage detrimental to concrete would prove equally as injurious to the mortar joints in brickwork. The amount of excavation required for both forms of sewers is nearly equal. Other points appearing so nearly the same in both brick and concrete sewers, there remains only to determine the relative cost of the two. In brickwork the shell can only be increased for different sizes of sewers by additional rings of brick which measure about four inches, while in concrete sewers the shell can be increased by as small an addition as one-half an inch. Probably the most effective argument in favor of concrete against brick construction is the fact that brick sewers can only be constructed with high-priced skilled labor, while for concrete the cheapest labor obtainable is often sufficient.

As a general rule concrete sewers are constructed in circular or near circular form, the thickness of shell being one inch per foot of diameter plus a fixed number of inches, this constant varying from one inch in reinforced concrete to three inches for plain concrete. Steel centering is now very generally used in concrete sewer construction.

The Committee on Sewers feel that the Society should, through its various committees, begin to take up the work of gathering and compiling data which could be tabulated and published and corrected from year to year so that soon we may have in the reports of our proceedings an index of the entire State relative to the condition and form of all public utilities such as sewers, disposal plants, water supply, filtration plants and drainage districts.

SALARIES OF OHIO OFFICIALS

THE annual report for 1907 of the Bureau of Inspection of Public Offices of Ohio contains the salaries of the various officials of all cities of the State. In the table below is a classification by size of city of the salaries of officials connected with public works.

Salaries in Ohio Cities in 1907 of Public Works Officials and Employees

Cities Having a Population Between	No. of Cities	Salaries of City Engineers			Total Salaries Engineer and Assistants			Salaries Members Board of Public Service			Street Laborers, per Day Average
		Maximum	Minimum	Average	Maximum	Minimum	Average	Maximum	Minimum	Average	
500,000 and 100,000	4	$5,000	$2,700	$3,675	$93,310.34	$25,746.44	$55,172	$5,000	$3,000	$3,750	$1.75
100,000 and 25,000	5	2,700	1,500	2,100	17,390.62	5,100.00	9,881	3,000	1,200	1,860	1.76
25,000 and 15,000	10	2,000	1,200	1,490	5,308.53	1,269.01	3,128	1,500	400	945	1.675
15,000 and 10,000	*9	1,600	180	1,158	6,290.73	418.40	2,143	900	200	444	1.655
10,000 and 7,000	†19	1,500	300	1,008	3,795.15	90.83	1,315	600	48	283	1.675
7,000 and 5,000	‡23	1,200	200	792	2,895.50	**4.00	681	400	15	187	1.69

*One by the day, at $4.50. †Five by the day, at $3.50, $4.00, $5.00, $5.00 and $7.00, respectively. Two have no city engineers. ‡One at $4.00 a day one at 40 cents an hour. Nine have no city engineers. **One city spent nothing for engineering.

REMOVING IRON FROM GROUND WATERS

Advantages of Ground Water—Soluble and Insoluble Iron Compounds—Conditions Influencing Precipitation—Effect of Alkalies, Ozone, Fungi—Deferrization of the Reading Supply—Designing Plants

In a paper of seventy pages presented before the American Society of Civil Engineers and entitled "The Purification of Ground Waters Containing Iron and Manganese," Robert Spurr Weston presents a most complete discussion of this subject, including the physical, chemical and bacterial principles involved, the history of past efforts towards the removal of these substances, and the methods more recently employed both in this country and abroad, special attention being given to the plant at Reading, Mass., where the writer has recently had to meet especially difficult conditions. For such as are not sufficiently interested to read through the entire paper, with its technical explanations, we present an abstract, which will serve to give a fairly complete idea of the matter treated of.

Few large cities in North America have been supplied with soft ground water. Indianapolis, Memphis and Havana have ground water supplies which are moderately hard, but up to the present time Brooklyn, Camden, Lowell, Newton, and Pueblo, Colo., are about the only large cities which have soft ground water supplies. In Europe many of the largest cities have such supplies and Breslau, Berlin and Hamburg are abandoning their filtered surface water supplies in favor of ground water.

"One reason for the paucity of ground water supplies is the lack of knowledge, on the part of engineers and others, of the geology and hydrology of the subterranean sources. However, great progress has been made in late years; there is more ground water existent than was generally supposed. It is present not only in the alluvium, but in some of the porous rocks, such as the Potsdam sandstone." It is believed by the writer that a thorough preliminary study of water problems would reveal, in many cases, satisfactory ground water sources. Such studies, however, should be carried on by one acquainted with hydrological methods. Often when true ground water cannot be obtained it may be practicable to supply consumers with artificial ground water obtained by irrigating sandy tracts with surface water and collecting the water from the same by suitable wells or collecting galleries.

The advantages of a good ground water over a filtered surface water supply may be summarized as follows: First, absence of color, odor and objectionable taste; second, safety; third, small seasonal variation in temperature; fourth, lower cost; fifth, less danger from frost. All ground waters are not satisfactory. Those which are too hard or too alkaline and those which contain more than small amounts of chlorides or traces of iron or manganese are unfit to use in their unpurified condition.

Typical ground waters containing iron, when freshly drawn, are nearly or quite clear and colorless, contain high amounts of carbon dioxide, sometimes considerable methane or hydrogen sulphide and are deficient in oxygen. They have the styptic or inky taste which is characteristic of iron. When sufficient oxygen has had access to such water it becomes turbid with insoluble iron which, after a shorter or longer time, gathers into flocs and finally precipitates, leaving the water colorless and free from iron. If such precipitation does not take place before the water enters the mains it is likely to occur in the distribution system, or after the water is drawn from the faucets; tea made with it is black, it causes rust spots on linen and white plumbing fixtures are stained. In some cases a fungus called *Crenothrix* grows in the pipes, feeding upon the organic matter and causing a precipitation of the iron contained in the water. This organism has been known to choke service pipes and small mains, and the odors due to its death and decomposition are extremely disagreeable.

Manganese-containing waters have similar characteristics, except that the precipitation is slower and the stains and deposits are much darker in color. Certain ground waters contain a little alumina which behaves in much the same way; but the precipitate is white and has never been known to cause trouble.

Either iron or manganese when contained in water may be in any one of three conditions; unoxidized or ferrous, in which condition it is soluble in water; oxidized or ferric, when it is almost insoluble in water containing oxygen; and colloidal or semi-soluble, in which condition it may be oxidized and yet to all outward appearances be in solution.

Certain of the iron bearing ground waters begin to precipitate the iron immediately after aeration; others hold the iron in solution indefinitely, even after aeration; and a third class precipitate a part of the iron within a few hours and hold the remainder in solution indefinitely. The second class have a decided color; clear and colorless ferruginous ground waters never contain oxygen. When both oxygen and iron are present, the water is either turbid or colored; the iron in the latter case being held in solution or suspension by vegetable matter.

The amount of iron in water may vary from a slight trace to more than 2,500 parts per million. As a rule, however, waters used for water supplies contain less than 10 parts per million. In Illinois, water from some springs contains as high as 997 parts of iron per million; wells in drift up to 11 parts per million; and rock wells vary from traces in many wells up to 2,506 parts per million found in a deep well in Marion county.

It has been found in many localities that the amount of iron increases with the use of the supply. Thus the Massachusetts State Board of Health in 1905 investigated 78 ground water supplies and found that in the preceding five years the iron in most of these had increased, several of them about 100 per cent., and one 500 per cent. This increase usually accompanies not so

much long continued use as increased draft. Mr. Weston believes that it is a false policy to abandon a ground water supply because of such increase since, if purified, it would be softer than a filtered surface water and in most cases more economical.

Iron Removal or Deferrization

Iron in ground water is in the form of a colloidal mixture. Soon after aerating, the salts dissolved in the water or the presence of suspended matter in contact with filtering material cause the colloid to coagulate and precipitate. The chief difficulty and aim of the engineer is to cause the precipitation to take place within a reasonable length of time. The first requirement is the presence of oxygen. The oxidation of ferrous hydrate depends on hydrolysis or the decomposition of water, by which the ferrous hydrate becomes oxidized into the insoluble ferric hydrate which exists in colloidal suspension and remains in solution until changed into insoluble gelatinous ferric hydrate by various conditions, in which form it is precipitated. In the oxidation a molecule of water is divided, the oxygen and one atom of hydrogen combining with the ferrous hydrate to form ferric hydrate, while the other atom of hydrate unites with the free oxygen to form water.

The amount of oxygen required for precipitation is not great. One part of oxygen will oxidize seven parts of iron. Often a leaky suction, badly packed glands, or a small air-cock will admit a sufficient quantity. Shavings, bone charcoal or magnetite used as a filtering material will often store up enough oxygen during washing or when standing idle to oxidize the iron in the water filtered afterward. The moist ferric hydrate which collects on the surface of the gravel and sand in aerators or filters while these are standing empty absorbs oxygen which serves the same purpose. Water standing in tanks and reservoirs, however, absorbs oxygen very slowly; six hours seldom sufficing for it to penetrate to a greater depth than four inches. Air and water should be brought into intimate contact by shaking or spraying, by letting the water fall through towers filled with coke, brick, wooden slats, or any other arrangement which will expose the water in drops or thin layers to the air.

Excessive aeration, however, is not only unnecessary but in some cases is exceedingly undesirable, rendering the precipitation of the iron more difficult. Compounds of iron and humus matter are difficult to treat, as they result usually from a mixture of the seepage from peaty deposits with iron-containing ground water, and the presence of carbon dioxide, which would be removed by excessive aeration, prevents the formation of this compound and allows the iron to be oxidized and removed. Oxidation is retarded by acids and accelerated by alkalies and by contact with rough surfaces, such as the material used in filters and aerators. Alkali, especially a caustic alkali, favors the reaction because it introduces OH ions, the excess of which hastens the action between the ferrous hydrate and the OH ions already present in the water. The precipitate is iron hydrate, that is, iron rust plus water. The particles may be so fine, however, that they remain in colloidal suspension indefinitely; in fact, this state of colloidal suspension is a transition stage between dissolved iron and precipitated sludge. The passing out of the colloidal stage is called coagulation. As this begins the fine particles attract and adhere to one another to form aggregates, which become large enough to be precipitated by gravity and to subside. Meanwhile, they attract other aggregates until the liquid is filled with visible flocs of slowly subsiding ferric hydrate. This process is not instantaneous, but may be finished in a few minutes or may require months, according to the character of the water.

Among the conditions which influence coagulation and precipitation are: The presence of electrolytes, of alkalies, of humus compounds; agitation and friction; contact with filtering material or precipitated iron hydrate; temperature, and the relative concentrations of positive and negative suspended colloids.

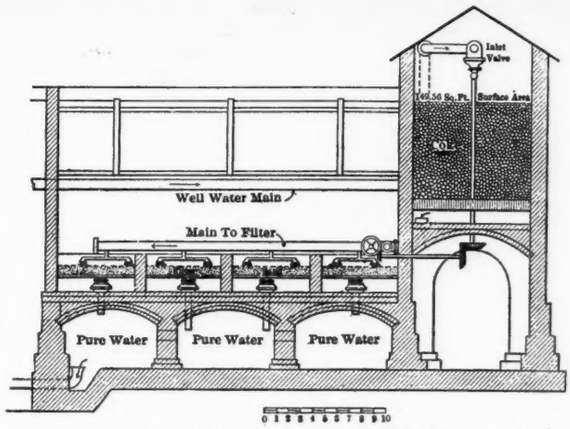
Several authorities believe that it is contact with the filtering material and not the size of this which precipitates and retains the ferric hydrate in the process of deferrization; the vital thing being multiplicity of surface contact. The same principle would seem to be involved in the fact that a little precipitated ferric hydrate added to water about to precipitate its iron will greatly accelerate this action. Such ferric hydrate may be conceived of as offering multitudinous nuclei around which the fine particles of suspended colloidal matters cluster.

The writer believes that the effect of temperature in hastening precipitation is too slight in the case of dilute solutions of fairly uniform temperatures to be of any considerable importance from an engineering standpoint.

While alkalies and ferric precipitate assist the removal of iron, humus matter in colloidal solution is a great hindrance to it. These gelatinous bodies are not precipitated by aeration, but remain in solution indefinitely until absorbed by suspended matter or destroyed by bacterial action. A very small amount of this matter will hinder the precipitation of a relative large amount of iron. Such matter is apt to be present in seepage water from near the surface, from which fact it is believed that the more recent the decomposition of vegetable matter therein the larger will be the proportion of these humus bodies in colloidal solution. They are, however, found to yield readily to treatment with ozone.

Ozone is an active oxidizer and also causes the precipation of iron from ground water in a marvelous manner; first by rapid ozidation of the iron; and, second, by the destruction of the organic matter in colloidal solution which interferes with precipitation. Hitherto the cost of ozone treatment has been prohibitive, but recent developments in France are so promising that it is probable that the cost will be reduced within practicable limits in the near future. Ozonized water, like aerated water, must be filtered before distribution.

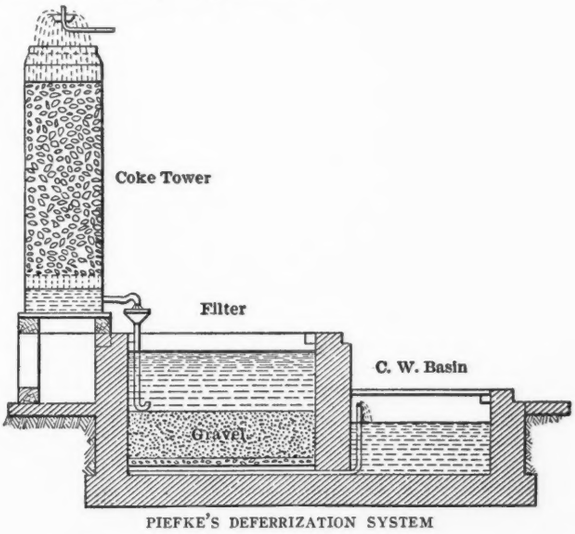
Iron is precipitated by the agency of organisms, especially of a group of fungi called iron bacteria, the growth of which is favored by the absence of light. The most



DEFERRIZATION PLANT AT HAMBURG

important of these are the *Crenothrix*, the *Leptothrix*, and the *Gallionella*. There seems to be a question whether the iron is a food for the growth of the fungus and is subsequently excreted by it, or whether the fungus causes the precipitation of the iron by contact.

Efforts to remove iron from water supplies appear to date from 1868, when Salbach built an aerator and filter at Halle. It was not until 1890 that any public water supplies were so treated in this country; but between 1890 and 1896 the Continental and other filter companies introduced several pressure filters for this purpose, notably the one at Asbury Park, N. J. These filters consisted of pairs of closed tanks, the first filled with sand and the second with bone charcoal. These were operated without any provision for aeration other than that supplied by leaky pistons and suction mains and by the air which was used to agitate the filter material during washing. Dr. T. M. Drown demonstrated at the Asbury Park plant in 1895 that without aeration iron was incompletely removed.

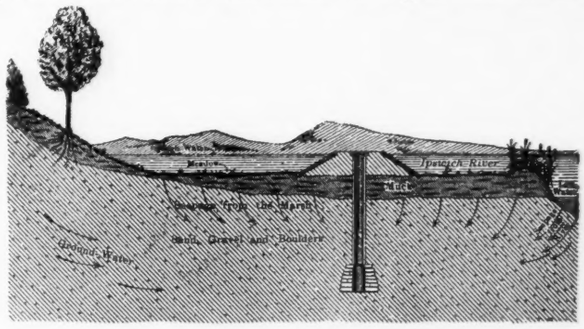


PIEFKE'S DEFERRIZATION SYSTEM

In both Europe and this country the present methods employ aeration and filtration, or double filtration. It has been customary to use coarse material for final filters. This has the advantage of causing the precipitation of the iron throughout the whole mass of the filter material and allows a far more economical operation of the plant. These filters, however, "break" quite frequently and permit turbid water to pass through; this being especially noticeable just before cleaning.

Deferrization of the Reading Supply

The Reading, Mass., water supply is obtained by means of a filter gallery built in 1870, which consists of a permeable masonry tunnel 2½ feet wide, 4 feet high and 240 feet long, placed in the water bearing gravel beneath the littoral marshes of the Ipswich River, which frequently overflows its banks. The bottom of the gallery is 22 feet below the surface of the ground, while the normal ground water level, even during droughts, is rarely 10 feet below the surface. Water is pumped from the gallery for about six hours a day, on an average, and at certain times of the year the ground water level may be depressed more than 20 feet below the surface just before pumping is finished. Three kinds of water find their way to this gallery; the true ground water which flows from the higher land toward



TYPICAL SECTION AT READING FILTER GALLERY

the river; seepage from the peaty matter immediately above the gallery; and water which filters directly into the gallery from the river. The waters from these three sources are different in character and the mixture obtained by pumping varies with the season, and at times from hour to hour during the day. In 1893 it was said that more than one-half of the water collected came from the river. The river water is somewhat colored with vegetable matter, contains oxygen, and could be coagulated with sulphate of alumium without difficulty. The ground water could probably be purified by simple aeration and filtration. The seepage from the overlying muck is rich in humus-like bodies and occasions considerable difficulty in effecting purification; since these substances, as stated before, do not readily precipitate and moreover hinder the precipitation of iron in the water.

Mr. Weston, after a long series of experiments with the treatment of this mixed water, found that by the addition of clay these matters were precipitated more successfully and at less expense than by any other treatment which was suggested, and the plant is now being changed to make use of this method of treatment. Previous to this, lime had been used as a precipitate, sulphate of aluminum being used in combination with it; this having the objection, however, that the hardness was considerably increased by the lime. It required 150 pounds of lime daily to treat about 200,000 gallons of water, but at present less than 15 pounds of clay are being used for the same amount of water; moreover

the amount of sulphate of aluminum has been reduced from more than three grains to about one grain per gallon.

DESIGN OF DEFERRIZATION PLANTS

The design of deferrization plants is governed largely by the character of the water. The subject is best discussed under the following heads, which are the names of the various parts of such a plant: Aerators, subsiding basins, roughing or contact filters, final filters, apparatus for chemical treatment.

Aerators.—If it is desirable to remove carbon dioxide from the water, the more thorough the aeration the better, and for this purpose one may use a great variety of devices. The tower type of aerator, such as is used in Germany, has the advantage of aiding the precipitation of the iron by contact with rough surfaces, which effect is not obtained in aerators consisting of simple sprays or superimposed perforated pans.

Where the water contains organic matter in colloidal solution and it is a disadvantage to liberate the carbon dioxide, it is often better to supply the requisite amount of oxygen by simple spraying or by admitting air into the suction of the pumps. The disadvantage of the tower type of aerator is that from 3 to 10 ft. of head is lost, and it seems to the writer that, if contact action is desired, it would be more economical to aerate by a simple spray, or superimposed perforated pans, or admission of air into the suction, and then pass the water through coarse gravel, thereby providing both aeration and contact without undue loss of head.

Subsiding Basins.—Where the precipitation is rapid, well-baffled subsiding basins are a decided economy, because they relieve the final filter of much work. In such cases they are to be preferred to a roughing filter of the same construction cost.

Roughing or Contact Filters.—These filters are simply beds of gravel through which the water passes either intermittently or continuously and either downward or upward. Experiments at Reading, as before noted, show how efficient these roughing filters are in preparing that water for final filtration. In most cases they are more economical than subsiding basins, and in many cases remove practically all the iron from the water. They should be designed, like some German filters, to deposit the iron all through the filtering layer and not on the surface only. The gravel should have rounded grains so that the bed may be flushed with ease.

The rate of filtration through roughing filters cannot be prescribed without knowledge of the water to be treated. For many waters a rate of 50,000,000 gal. per acre per day may be used. When higher rates are used the retention of iron hydrate may be diminished. This factor also is dependent upon the character of the water.

Final Filters.—Final filters may be of varying degrees of fineness, ranging from the gravel which will be retained by a sieve having four meshes to the inch to sand having an effective size of 0.12 mm.

It is desirable when coarse material is used to cause the precipitation of the iron throughout the whole layer of filtering material instead of near the surface, as is best in the case of surface water purification. In Germany this is accomplished by grading the filter material. Filters of this kind, at Leipsic, Stargard and Hamburg have been already described.

The aim of all deferrization plants is, of course, to increase the speed of precipitation, and it may be laid down as a general rule that the coarser final filters are most useful in waters which precipitate their iron rapidly and in coarse flocs. Waters which are difficult to treat, however, while they may be improved greatly by passing through a coarse roughing filter of ordinary thickness, almost invariably require a final filtration before being suitable for consumption. Mechanical filters are almost invariably used with waters requiring chemical treatment. There are no materials superior to sand and gravel for use in filters.

The properly treated water may be filtered through the final filters at almost any practicable rate, and for this purpose mechanical filters are to be preferred as a rule. However, slow filters at 15,000,000-gal. rates may be found more economical in many cases, especially where preceded by roughing filters, which latter would increase the quantity of water filtered between scrapings. At Far Rockaway, N. Y., a growth of algæ forms a mat on the surface of the bed, which mat can be easily rolled and removed, taking with it the accumulations of iron at the surface of the bed, and reducing the cost of scraping.

Apparatus for Chemical Treatment.—The apparatus for applying sulphate of aluminum should be the same as that used for the purification of muddy river waters. Lime can be added either in the form of milk of lime, or, more economically, as a saturated solution, as is practiced at St. Louis, Mo., and other cities. Clay is best added in the form of a suspension. The clay for this purpose should be selected carefully, and that which has the largest percentage of finely divided particles should be chosen for use. It should be mixed with water, the heavier particles should be allowed to subside, and the suspension of fine particles should be fed into the water by an orifice tank through which the suspension is circulating continuously. A thorough mixing of the chemicals with the water to be treated hastens the speed of precipitation. Very often it is desirable to subject waters treated with chemicals to a preliminary filtration through a roughing filter before giving them a final filtration. The decision in this case should depend upon the comparative costs of coagulating basins and roughing filters of like efficiencies, and the costs of scraping or washing the final filter with and without such preliminary treatment.

The writer feels disinclined to discuss the arrangement and choice of ozone apparatus with the limited data at hand. It is enough to say that the ozone treatment is simply aeration with ozonized air, and the ozonization of the water takes place under similar conditions, but with the exclusion of the external air.

CONCLUSION

The first requisite for the deferrization or demanganization of a water is a thorough knowledge of the water itself, not only from a chemical but also from a physical and geological standpoint. All alkaline ground-waters will precipitate their iron ultimately, although it may require months in some cases. Those moderately hard waters free from any considerable amount of organic matter, which begin to throw down iron as soon as they appear above the surface of the ground, need only to be aerated and filtered through coarse material; while those which precipitate iron more slowly require more aeration and more contact with filtering material and the accumulated ferric hydrate to get good results.

Those waters containing interfering amounts of organic matter must be specially treated. Either there is an excess of organic matter holding the iron hydrate in suspension, an excess of iron holding the organic matter in suspension, or the organic matter is in colloidal solution and interferes with the precipitation of the ferric hydrate.

In the first two cases it is necessary, in the language of physical chemists, to "balance" the electric charges of the suspended particles. That is, if the iron be in excess, add a negative colloid like suspended clay or organic matter; or if organic matter be in excess, add iron or aluminum hydrate. If organic matter in solution interferes, it is possible to add lime, which forms an insoluble compound with the humus matter; to treat the water with ozone which destroys it, or to increase the bulk of precipitate by adding both positive and negative colloids, for example, sulphate of aluminum and clay, and, by the absorptive action of the greater bulk of precipitate, to overcome its effect.

In a few words, the aim of every process should be to allow time enough for the oxidation and coagulation of the iron or to shorten the required time by aeration, by contact, by balancing the several kinds of suspended colloidal matter so as to mutually precipitate one another, or, if necessary, by increasing the mass of precipitate so as to outweigh the effect of all interfering substances which may be present in the water treated.

DISCUSSIONS, QUESTIONS AND ANSWERS

Readers of the Municipal Journal and Engineer are invited to send for publication in this department inquiries concerning such matters as can probably be answered from the personal experiences of others, or from information on file in this office. Any who can furnish the desired information are requested to do so, in addition to any reply which may be given by us.

It is especially desired that an exchange of opinions and discussions on mooted subjects find place here. We will welcome any opinions, whether or not we agree with them; requesting, however, the omission of all personalities.

PROTECTING SEWERS IN ALKALINE SOILS

Editor MUNICIPAL JOURNAL AND ENGINEER,
New York City.

DEAR SIR:—I have just finished reading an article in your journal entitled, "Cement in Alkaline Soils." The article goes on to state that some of the sewers in Great Falls, Mont., had been acted on injuriously by some unknown agency, an examination had been made by the Head of the Experiment Station of the Agricultural College which showed that alkali in the soil had been the cause of the disintegration. As a method of avoiding such disintegration those who conducted the experiments suggest the prevention of all ground water from reaching the sewers. This certainly appears to be a reasonable suggestion. As a means to prevent ground water from reaching the sewers they suggest sub-drains of ample size and the surrounding of both these and the sewers with gravel or other porous material so that all water reaching the sewer would at once be drained off. The article goes on to state that when this cannot be done they unhesitatingly recommend that cement be not used.

The idea has struck me that a cheaper and as fully effective a method of preventing the alkali contaminated water from coming in contact with the sewer would be to give the pipe a waterproof coating of some material which would be unaffected by alkali.

If such a treatment would be a proper precaution, I would like to know if a coating of pitch would have the desired effect. If this would secure this beneficial result it would seem to be a less expensive remedy than sub-drains and would prove practical not only in places where sub-drains could be laid, but could be used throughout the whole system.

Yours truly, W. P. M.

The idea would seem to be a good one. We would be glad to hear from others, especially those who may have employed similar methods. Where the sewer is of concrete built in place we do not see how the outside could be protected in this way below the springing line. Concrete pipe could of course be coated before being lowered into the trench.

COST OF MAINTAINING PATROL WAGONS

Editor MUNICIPAL JOURNAL AND ENGINEER,
231 West 39th Street,
New York City.

Gentlemen:—Can you furnish me any data showing the cost of maintaining the horse and the automobile patrol wagon? Any information showing the advantages and disadvantages will be greatly appreciated. Respectfully,

J. R. R.

In MUNICIPAL JOURNAL AND ENGINEER for April 1, 1908, is a comparative statement of costs of horse and automobile fire apparatus. A comparison of the cost of horse and automobile auxiliary squads in Springfield, Mass., appeared in the issue of April 8, 1908. The cost of stable and horse maintenance in Boston will be found in the issue for September 25, 1907. These do not refer to patrol wagons, however, but to hose and chemical wagons and fire engines. We do not know of any data concerning patrol wagons having been published, but will be glad to receive, for the information of this inquirer, any figures such as he asks for.

CONCERNING PAVEMENT PATENTS

Editor MUNICIPAL JOURNAL AND ENGINEER,
241 W. Thirty-ninth Street,
New York City.

DEAR SIR:—Two items in your last issue seem to be of special interest to municipal officers; I refer to the two legal decisions on patent rights.

The "Westrumite" patent you report as decided in Illinois by the United States Circuit Court to be invalid; the Warren patent as upheld by the United States Circuit Court in Michigan.

Your remarks on the latter decision, "We do not understand that this patent covers a mixture of a bituminous substance with broken stone generally, when no attempt is made to grade the mixture so as to reduce the voids below 21 per cent.," is, it is to be hoped, a correct conclusion, although it does not go far enough. With the most talented engineers and road supervisors almost unanimously of the opinion that the only cure for the prevention of dust and for overcoming the wear so greatly increased by automobile traffic on macadam roads is the adoption of an asphaltic concrete for the wearing surface, it certainly would be detrimental to the interests of the country at large should it be contended that a mixture of the old-fashioned surface material with hot cement of a bituminous nature were an infringement on any one's patent.

"Inherent stability" has a wonderful sound and is an excellent hypnotic phrase to have been coined; but the admixture of broken stone and sand to give the least possible amount of void is certainly not a new one.

Mr. G. Knoche, architect and civic engineer, over a quarter of a century ago took this as one of the principal features in the construction of Portland cement arches for floors in his early work in Philadelphia. Although Mr. Clifford Richardson may have made the error of giving as his experience "that the best asphaltic pavements were those containing the smallest proportion of coarser sized particles," it by no means follows that other builders of asphalt construction were not fully alive to the fact, and had not used mixtures of different sizes of stone, from two inches down to sand, to give "inherent stability."

As the amount of pure bitumen required to contribute perfect bonding properties to an asphaltic concrete is only 11 per cent., any careful contractor would naturally seek to have voids far below 21 per cent.

The old adage that "there is nothing new under the sun" does not appear to be the faith of the Patent Office, as one can rarely read over the lists of patents applied for without finding ideas claimed as new that are "as old as the hills." Municipalities are indeed continually cramped on would-be improvements and put to thousands of dollars expense by the everlasting lawsuits in which they are embroiled by companies whose principal assets would seem to be a staff of lawyers.

Some of our best street and road construction was designed by such men as the late General John Newton and D. Lowber Smith, and by Edward P. North, and Nelson P. Lewis, of New York, James E. Owen of New Jersey, James H. McDonald of Connecticut, and Samuel C. Lancaster of the State of Washington.

Such men did not seek patents, nor did they ever expect to have work done under their supervision except by fair-dealing contractors, who could obtain their work by fair and legitimate competition.

Yours very truly,

NEW YORK, JAN. 28, 1909. T. HUGH BOORMAN.

MUNICIPAL BOND SALES DURING DECEMBER

NAME OF CITY	Estimated Population	ACTUAL VALUE OF ASSESSABLE PROPERTY (estimated) Total	Per Capita	Ratio of ass'd to act'l value	Bonded Debt	Sinking Fund	NET BONDED DEBT Total	Per Capita	Tax Rate Per $1,000 Ass'd Value	BOND SALES, DECEMBER, 1908 Term of Years	Amount	Interest	Price	Basis
El Centro, Cal.	1,750	$1,500,000	$857	33⅓%	$40,000	.....	$40,000	$23.00	$0.75	1-20 ser.	$40,000	5%	Par	.....
Selma, Cal.	2,500	2,500,000	1,000	25	50,000	.....	50,000	20.00	3.10	1-20 ser.	50,000	5% s.a.	103.151	4.617
Colorado Springs, Col.	.....	.....	.....	.....	.....	.....	.....	.....	.....	10-15 op.	25,000	4%	Par	.....
Brunswick, Ga.	.....	.....	.....	.....	.....	.....	.....	.....	.....	12	64,000	5% s.a.	104.84	4.474
Urbana, Ill.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	20,000	4% s.a.	101.713	.....
Gary, Ind.	15,000	8,191,000	546	10	45,000	.....	45,000	3.00	8.50	10	45,000	4½%	104.09	4.00
Martinsville, Ind.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	14,000	5% s.a.	.....	4.50
Terre Haute, Ind.	65,000	50,000,000	777	61	506,000	$40,000	466,000	7.00	10.50	8-10 op.-av.	70,000	4% s.a.	102.20	3.68
Hampton, Ia.	2,800	2,307,968	824	25	15,000	.....	15,000	5.00	7.00	10	9,000	5%	Par	.....
Baldwin, Kan.	.....	.....	.....	.....	.....	.....	.....	.....	.....	25	35,000	4½%	Par	.....
Hays, Kan.	.....	.....	.....	.....	.....	.....	.....	.....	.....	20	18,000	5% s.a.	101.894	4.851
Ashland, Ky.	10,000	8,000,000	800	60	33,000	30,000	3,000	.30	12.50	.....	9,000	6%	Par	.....
Latonia, Ky.	5,000	5,000,000	1,000	40	15,000	7,000	8,000	1.60	12.50	5-10 ser.	11,300	6%	Par	.....
Lexington, Ky.	45,000	30,000,000	666	74	982,461	.....	982,461	21.00	17.00	40	25,000	4½% s.a.	108.44	4.051
Agawam, Mass.	.....	.....	.....	.....	.....	.....	.....	.....	.....	13-16 ser.	4,000	4% s.a.	104.539	3.595
Clinton, Mass.	.....	.....	.....	.....	.....	.....	.....	.....	.....	1-20 ser.	120,000	4% s.a.	104.44	3.491
Easthampton, Mass.	.....	.....	.....	.....	.....	.....	.....	.....	.....	1-16 ser.	32,000	3¾%	100.11	3.734
Hyde Park, Mass.	16,000	13,500,000	843	100	234,000	.....	234,000	14.00	17.30	5½ av.	26,000	4% s.a.	102.311	3.519
Lawrence, Mass.	76,616	54,246,294	708	.....	2,088,300	135,693	1,952,607	25.00	16.40	1-10 ser.	150,000	4% s.a.	102.518	3.492
Medford, Mass.	21,500	21,756,800	1,013	100	1,185,000	827,199	357,801	16.00	20.20	20	36,000	4%	108.15	3.433
New Bedford, Mass.	90,000	70,719,086	785	100	5,564,000	1,574,871	4,016,129	44.62	17.60	1-20 ser.	100,000	3½%	100.079	3.491
										4⅝ av.	30,000	4%	101.215	3.717
Rockland, Mass.	.....	.....	.....	.....	.....	.....	.....	.....	.....	1-20 ser.	60,000	4%	104.37	3.498
										41-6 av.	3,000	1½%		
Ionia, Mich.	.....	.....	.....	.....	.....	.....	.....	.....	.....	5⅜ av.	4,000	1½%	101.27	4.285
										6 1-6 av.	5,000	1½%		
										10½ av.	5,000	1½%		
Pontiac, Mich.	12,000	8,000,000	667	75	223,000	6,417	216,583	18.05	21.00	1-10 ser.	10,000	5% s.a.	103.51	4.271
Port Huron, Mich.	22,000	17,000,000	772	66⅔	951,395	36,500	914,895	41.00	23.15	9½ av.	20,500	5% s.a.	106.448	4.017
Red Wing, Minn.	10,000	7,500,000	750	42	143,000	.....	143,000	14.30	33.60	16	9,000	4%	Par	.....
Watab, Minn.	.....	.....	.....	.....	.....	.....	.....	.....	.....	7 av.	1,500	6% s.a.	Par	.....
New Albany, Miss.	.....	.....	.....	.....	.....	.....	.....	.....	.....	20	10,000	5%	Par	.....
Glendive, Mont.	3,000	100,000	33	50	65,000	.....	65,000	21.66	10.00	10-20 op.-av.	15,000	5%	101.583	4.798
Snyder, Neb.	300	356,000	1,181	20	9,000	.....	9,000	30.00	0.70	5-20 op	9,000	5% a.	100.277	4.937
Ely, Nev.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	40,000	6%	92.00	.....
Hoboken, N. J.	70,000	72,700,000	1,038	100	2,095,969	281,800	1,814,169	25.00	15.10	30	110,500	4% s.a.	102.379	3.865
Irvington, N. J.	.....	.....	.....	.....	.....	.....	.....	.....	.....	30	55,000	4½% s.a.	107.14	4.085
North Arlington, N. J.	.....	.....	.....	.....	.....	.....	.....	.....	.....	25	25,000	4½% s.a.	100.25	4.483
Passaic, N. J.	43,000	26,892,714	624	100	762,750	7,501	755,249	17.00	14.10	20	256,000	4% s.a.	101.487	4.015
										1-30 ser.	90,000	4½% s.a.	101.487	4.015
Summit, N. J.	.....	.....	.....	.....	.....	.....	.....	.....	.....	30	70,000	4½% s.a.	107.41	4.07
Altmont, N. Y.	.....	.....	.....	.....	.....	.....	.....	.....	.....	5-16 ser.	6,000	4¼%	100.416	4.098
										5-29 ser.	102,500	4%	100.016	3.998
East Rochester, N. Y.	.....	.....	.....	.....	.....	.....	.....	.....	.....	5-29 ser.	35,000	4.10%	100.108	4.091
										5-29 ser.	6,500	4.10%	100.13	4.089
Haverstraw, N. Y.	.....	.....	.....	.....	.....	.....	.....	.....	.....	15 1-6 av.	70,000	4.12%	Par	.....
Mamaroneck, N. Y.	5,000	.....	.....	.....	215,000	.....	215,000	43.00	7.33	5-24 ser.	10,000	4%	100.43	3.961
Mt. Vernon, N. Y.	30,000	35,560,000	1,185	8	2,278,000	613	2,277,687	75.92	20.70	40½ av.	40,000	4½% s.a.	110.412	3.098
										26	30,000	4½% s.a.	109.01	3.943
New Rochelle, N. Y.	27,000	24,000,000	889	.....	1,772,017	.....	1,772,017	65.63	24.62	16⅜ av.	107,500	5% s.a.	112.571	3.965
										8 mos.	125,000	6%	101.128	4.087
Niagara Falls, N. Y.	32,000	50,000,000	1,562	44	1,520,909	.....	1,520,909	47.00	17.65	19	70,500	4% s.a.	101.62	3.878
Ogdensburg, N. Y.	15,000	5,363,470	357	62	174,900	.....	174,900	11.00	17.30	12⅞ av.	5,000	4% s.a.	Par	.....
										1-20 ser.	45,000	4½% s.a.	105.27	3.884
Troy, N. Y.	76,000	55,986,974	736	100	3,956,606	148,355	3,808,251	50.00	16.90	1-20 ser.	20,983	4½% s.a.	105.26	3.885
										1-20 ser.	10,936	4½% s.a.	105.25	3.886
Yonkers, N. Y.	68,000	60,019,750	883	.....	5,018,682	299,600	4,719,082	60.40	24.48	1-20 ser.	51,000	4½% s.a.	102.333	4.023
										1-10 ser.	100,000	4½% s.a.	104.555	3.965
Ellendale, N. D.	1,500	900,000	600	33⅓	12,000	2,373	9,627	6.00	33.00	17½ av.	6,000	6% a.	105.75	5.476
Alliance, O.	15,000	12,467,370	831	33⅓	578,190	.....	578,190	38.54	30.20	2	2,850	5% s.a.	100.228	4.088
										10	1,500	4½% s.a.	100.566	4.429
Applecreek, O.	400	200,000	500	.....	.....	.....	.....	.....	18.44	2-21 ser.	7,000	4½% s.a.	103.042	.....
Ashtabula, O.	18,000	7,000,000	388	25	200,000	85,000	115,000	6.00	.....	10½ av.	60,000	4% s.a.	100.936	3.888
Chillicothe, O.	.....	.....	.....	.....	.....	.....	.....	.....	.....	14⅜	2,400	4% s.a.	101.708	3.847
Delta, O.	2,200	1,800,000	454	40	58,475	.....	58,475	26.00	1.80	13¾ av.	25,000	4½% s.a.	104.74	4.047
Elmwood Place, O.	.....	.....	.....	.....	.....	.....	.....	.....	.....	19½ av.	25,000	5% s.a.	110.80	4.184
Hartwell, O.	.....	.....	.....	.....	.....	.....	.....	.....	.....	25	35,000	4% s.a.	102.29	3.856
Newburg Heights, O.	.....	.....	.....	.....	.....	.....	.....	.....	.....	20	5,000	5% s.a.	110.56	4.213
										7	4,000	5%	106.118	4.096
Niles, O.	.....	.....	.....	.....	.....	.....	.....	.....	.....	10 5-6	2,000	5%	106.118	4.096
										6 5-6	1,000	5%	106.888	4.078
										9 av.	8,000	5%	106.888	4.078
										25	90,000	4% s.a.	103.04	3.081
										1-10 ser.	12,396	4½% a.	102.30	3.982
Norwood, O.	15,000	8,515,270	567	60	880,672	65,819	814,853	54.00	13.84	25	5,000	4½% s.a.	110.01	3.871
										1-10 ser.	5,811	4½% s.a.	101.99	4.092
										1-10 ser.	18,308	4½% s.a.	102.00	4.009
										1-10 ser.	2,040	4½% s.a.	102.05	4.008
										1-10 ser.	3,965	4½% s.a.	102.01	4.088
Painesville, O.	.....	.....	.....	.....	.....	.....	.....	.....	.....	10¾ av.	15,000	4% s.a.	100.769	3.911
										5⅞ av.	1,000	4% s.a.	100.97	3.844
Poland, O.	450	160,000	355	.....	1,500	800	700	1.55	3.30	11½ av.	5,000	4% s.a.	100.97	3.844
										4 av.	2,090	5%	101.196	4.669
Portsmouth, O.	26,000	16,000,000	615	59	859,000	54,000	865,000	30.00	34.00	6½ av.	1,500	5%	102.133	4.613
Rockport, O.	.....	.....	.....	.....	.....	.....	.....	.....	.....	6 av.	51,500	4% s.a.	100.418	3.921
Sandusky, O.	23,000	14,000,000	608	50	640,000	10,000	630,000	27.39	16.92	30	9,000	4½% s.a.	107.25	4.079
Steubenville, O.	.....	.....	.....	.....	.....	.....	.....	.....	.....	8	5,000	4% s.a.	100.69	3.898
Stryker, O.	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	14,000	4½% s.a.	102.507	3.943
Wyoming, O.	.....	.....	.....	.....	.....	.....	.....	.....	.....	2½ av.	1,000	4½% s.a.	Par	.....
										30	2,000	4% s.a.	102.81	3.841
										2½ av.	2,000	5% s.a.	101.625	4.254
										2⅞ av.	750	5% s.a.	101.133	4.552
										3¾ av.	8,230	5% s.a.	103.007	4.121
Youngstown, O.	60,483	56,882,000	940	50	1,269,112	209,167	1,059,945	17.22	29.42	3 5-6 av.	10,000	5% s.a.	102.50	4.021
										3 5-6 av.	10,325	5% s.a.	103.167	4.112
										3 5-6 av.	5,000	5% s.a.	103.20	4.106
										3 5-6 av.	700	5% s.a.	101.50	4.806
Anadarko, Okla.	.....	.....	.....	.....	.....	.....	.....	.....	.....	20	100,000	5½%	100.50	5.458
Granite, Okla.	.....	.....	.....	.....	.....	.....	.....	.....	.....	10-30 op.	20,000	6% s.a.	101.25	5.836
Milton, Ore.	1,500	1,000,000	666	60	46,000	.....	46,000	30.00	6.00	10-15 op.	15,000	5%	Par	.....
Chester, Pa.	40,000	27,000,000	675	64	611,000	114,870	496,130	12.00	10.00	10-30 op.	70,000	4% s.a.	101.587	3.807
West Homestead, Pa.	.....	.....	.....	.....	.....	.....	.....	.....	.....	2-26 ser.	25,000	4½% s.a.	Par	.....
Aberdeen, S. D.	10,000	2,951,072	295	33⅓	156,500	32,076	124,423	12.44	19.00	20	50,000	4½%	102.50	4.311
Redfield, S. D.	.....	.....	.....	.....	.....	.....	.....	.....	.....	20	18,000	.....	101.66	.....
Knoxville, Tenn.	65,000	.....	.....	40	1,376,000	14,311	1,361,689	20.00	17.00	1⅞ av.	60,000	6% s.a.	Par	.....
Lehi, Utah.	3,500	750,000	214	70	16,025	.....	16,025	4.00	10.00	10-20 op.	26,500	5% s.a.	Par	.....
Chase City, Va.	800	800,000	1,000	40	9,000	1,000	8,000	10.00	1.00	19 5-6 av.	60,000	5%	101.058	4.916
Guyandotte, W. Va.	.....	.....	.....	.....	.....	.....	.....	.....	.....	10	26,000	5% a.	102.00	4.746
Green Bay, Wis.	24,000	13,411,890	558	65	259,000	.....	259,000	10.00	16.70	14½ av.	150,000	4½% s.a.	105.40	4.001
Merrill, Wis.	10,000	5,000,000	500	74	91,100	.....	91,100	9.11	24.70	10-19 ser.	50,000	4½%	101.20	4.387

NEWS OF THE MUNICIPALITIES

Divers Subjects of General Interest and Their Treatment by City Councils and Officials—Streets, Water Works Lighting and Sanitary Matters—Police and Fire Items—Government and Finance

ROADS AND PAVEMENTS

City Engineer Making Map of City

Altoona, Pa.—During the cold weather, when there is little outside work to be done, City Engineer Frans Engstrom and his employees are engaged in making a map of the city and straightening out the Registry Department of his office. This Department was created by Councils about two years ago with the object of having a complete record of all the property within the limits of the city, and the work has gone on steadily, but the record is far from being complete. Notices are being constantly sent out to property owners to bring in their deeds for registry. In order to verify the accuracy of the records, arrangements have been made with a firm of lawyers to get abstracts of all the old farm lands upon which the city has been built and thus ascertain how these lands were subsequently subdivided and then laid out in blocks and streets.

Stringent Regulations Regarding Street Openings

Bridgeport, Conn.—Mayor Henry Lee has prepared an amendment to the city charter which will undoubtedly become a law which provides that corporations or individuals must first apply to the City Auditor, in his capacity as Clerk of the Public Works Department, for a permit to open a street. This proceeding is now followed but the conditions on which the permits are to be issued is radically different. A person or corporation who receives a permit agrees to allow the Public Works Department to close up the excavation and to pay the city the cost of the work. Then all street openings would be closed in a proper manner by the Public Works Director. The amendment further provides that no permit shall be issued until the applicant has paid for work which has previously been done by the city in closing up previous excavations for him. The Mayor is of the opinion that such provisions in the city charter will correct the abuses of the privilege of opening streets.

Tar Macadam and Bitulithic in Duluth

Duluth, Minn.—In a communication to Council enclosing a proposition from the Warren Bros. Company to compromise the two patent infringement suits against the city, Mayor Haven has recommended that no settlement be made. He contends that the Michigan cases are not identical with the Duluth case. The Warrens claim the city has laid about 84,000 yards of tar macadam pavement in violation of the Warren patents, and ask a settlement on a basis of 25 cents a square yard, a royalty which is being paid by several other cities, it is claimed.

Paving by Assessment Proposed

Wheeling, W. Va.—The Committee on Municipal Affairs of the Board of Trade has prepared a memorial to be presented to the State Legislature, asking that there be passed a law permitting the city to assess property owners for a portion of the cost of paving streets.

Pays for Concrete Gutter as Paving

Utica, N. Y.—Complaint has been made regarding the practice of measuring up the gutter portion of the concrete curb and gutter and paying contractors for it as paving besides paying for the item of concrete curb and gutter at a price per linear foot. On the face of the matter it looks like giving double pay. But City Engineer O'Brien says that the custom has been followed for many years and that it is well known by contractors, and taken into account in their bids as shown in the low prices bid on curb and gutter.

Unbalanced Asphalt Bids Rejected

Baltimore, Md.—After listening to a debate between four bidders for some 18,000 square yards of asphalt pavement repairs, the Board of Awards, by the advice of City Solicitor Poe, voted to reject all bids. The specifications named the number of yards of surface, but did not state the quantities of other materials that might be needed for repairs. It was shown that the specifications could be so construed as to make either Warren Brothers or F. E. Schneider & Co. the lowest bidder. In the bids to be asked for the approximate quantities of the materials will be inserted.

Record Work in Paving

Mobile, Ala.—Hobson & Muths, sub-contractors under Jett Brothers, have completed the paving of Government street, and in one day's work established a new paving record, 2,600 yards of wooden block being laid by the contractors' force of laborers on the concrete base in ten hours' work. The best day's work done in other cities on any kind of pavement is said to be at 2,000 yards. The paving work on Government street has been pushed with extraordinary rapidity. The length of the street is six blocks and it is the widest in the city, with two street car lines. The storm sewers and connections to property within this area were laid in ten days and the entire concreting and laying of treated wooden blocks has been accomplished in twenty-one days. This is the fastest work ever done in Mobile.

Streets Stand Test of Traffic

South Bend, Ind.—Coal tar and sand preparation for streets is no longer an experiment in South Bend, according to City Engineer Alonzo J. Hammond. There was some doubt when Portage avenue and Leeper hill thoroughfares were treated with coal tar last summer, but the streets have stood the test and plans are making to treat other streets in the same manner this year. One of these will be Leland avenue. Roadways treated with coal tar will stand the wear of heavy traffic, it is believed, and will be freer from dust, it is claimed, than ordinary thoroughfares of gravel, and can be made with small expense.

SEWERAGE AND SANITATION

Would Have a Municipal Abattoir

Dayton, O.—A suggestion for a municipal abattoir such as are in use in New Orleans, La., and Montgomery, Ala., is endorsed by Health Officer Goodhue. He says that such an institution could be erected for $100,000, and there is no cost of maintenance, it being self-sustaining. At the same time it pays for all inspection. The Dayton health officer says it is impossible for the inspectors to get over the score of slaughter houses within twenty miles, and that an abattoir would solve the pure-meat problem.

Construction of Lateral Sewers Discussed

Louisville, Ky.—The Board of Public Works has issued a statement to the public on the construction of lateral sewers. The purpose of the bulletin is to call the attention of citizens to the need of lateral sewers and correct the impression prevailing in some quarters that with the completion of the trunk sewers the city will be in good sanitary condition so far as sewerage is concerned. For the construction of laterals a percentage of the tax levy amounting to about $75,000 is allowed. This, however, is insufficient to construct all the laterals asked for. Sewerage conditions would be much improved if citizens would cooperate with the Board in the enforcement of the ordinance requiring that every house abutting on a street or alley in which there is a sewer shall be connected with that sewer.

Public Interest in Tuberculosis Clinic

Indianapolis, Ind.—The City Board of Health is about to begin street car advertising for the purpose of arousing public interest in the free tuberculosis clinic conducted at the Bobbs Dispensary. While the clinic has been having a steady growth for some weeks, the Board feels that not enough people are taking advantage of it. The space in the street cars is to be donated for sixty days. Large cards, similar to those placed in drug stores and public buildings, will be used in the advertising.

To Remove House Traps

Irvington, N. J.—The Engineering Committee of the Joint Sewer Commission has issued a recommendation asking that the various municipalities interested in the trunk sewer so amend their plumbing codes as to provide for the removal of all intercepting house traps as the best method of dealing with the sewer gas problem. The recommendation is contained in the report of the committee, which is made up of Alexander Potter, Edward S. Rankin and Edmund R. Halsey, on the condition of Augusta street and Lincoln place, Irvington.

Wants State to Establish Milk Standard

Memphis, Tenn.—In a report to the Board of Health, P. W. Holtzendroff, City Chemist, refers to a former report of bacteriological examinations of milk, which showed a high percentage of bacteria and filth in many cases, and recommends that efforts be made to have a State law enacted which will provide for a bacteriological standard. Under present conditions the Board of Health cannot enforce such a standard as is needed.

Mosquito Extermination in a Jersey Town

Summit, N. J.—In the work of mosquito extermination carried on by the Board of Health during the past year the annual report says that 2,700 ponds, pools, cesspools and other mosquito-breeding places had been treated with oil at a total expense of $327.69, and the freedom enjoyed from the pest in this city during the past summer, the Health Officer points out, was due to the Board having started the crusade of extermination in the early spring.

Year's Work of Health Department

Washington, D. C.—During the year 1908 the Health Department made the following inspections: Public markets, 1,494; grocery stores, bakeries and confectioneries, 21,375, and hucksters' goods, 1,721; dairies, 1,266, and 3,425 samples of milk collected and examined in the chemical laboratory; 104 samples of cream, 23 samples of skimmed milk, 27 samples of butter-milk, 43 of vinegar, 49 of candy, 2 of ice cream, 16 of lard, 410 samples of water were collected and examined in the chemical laboratory. During this period there were made 4,843 inspections of dairy farms by the six veterinary inspectors of this department. In the course of these 4,843 inspections of dairy farms 72,405 examinations were made of dairy cattle, resulting in the condemnation of 172 cows for various causes, rendering them unfit for use for dairy purposes. During this calendar year 531 inspections of private slaughter houses not under federal inspection were made. In the course of these inspections of slaughter houses 513 steers, 1,965 sheep and 735 calves were examined. One sanitary inspector detailed as smoke inspector made 12,204 observations and noted 1,067 violations. There were 28,599 nuisances reported by nine sanitary inspectors. These nuisances consisted of unclean private alleys, yards, areas, cellars, sheds, stables and water closets; filthy lots, lots overgrown with weeds and lots containing stagnant water; unlawful accumulations of manure, unlawful manure bins, unlawful privies, leaky roofs, defective plumbing, obstructed sewers and premises not connected with the public sewer and water main, a sewer and water main being available to serve the same. Two sanitary inspectors made 1,375 inspections of barber shops, 124 of hotels and 33,112 inspections of lunchrooms.

Doctors to Help Pure Milk Fight

Pittsburg, Pa.—The Milk Commission of the Allegheny County Medical Society has taken a hand in the war on impure milk. The Commission has organized a campaign for "certified milk," has installed a system of certifying pure milk, and will shortly make an appeal to the public for financial aid in carrying on a crusade. Through the insistence of the Commission, Superintendent J. F. Edwards of the Pittsburg Bureau of Health has sent three inspectors into Northeastern Ohio to inspect the dairies which furnish Pittsburg with her milk supply. Dr. Edwards will soon call a meeting of all of the milk dealers of Greater Pittsburg to place before them data which his agents are gathering. The milk men have expressed a willingness to co-operate with Dr. Edwards, and the Milk Commission of the medical society was organized at his suggestion.

WATER SUPPLY

Shortage of Water Due to Small Taps

Brooklyn, N. Y.—That the shortness of the water supply obtainable in the homes of Brooklyn residents, which has been the subject of bitter complaint in the last few years, is due entirely to the small taps now in use, is the interesting discovery made by Deputy Water Commissioner Cozier in an investigation just concluded. He found that all of the three-story houses and smaller buildings are supplied with half-inch taps, and most of these have been in service so long that the interiors are corroded or lined with accumulations, so that the half-inch taps are in reality only quarter-inch taps, so far as service is concerned. To determine for himself the advisability of installing bigger taps to connect buildings with street mains, Commissioner Cozier made a series of experiments. He found that one-eighth of an inch made a tremendous difference in the carrying capacity. The result is, that from now on plumbers will get permits for taps measuring not less than five-eighths of an inch.

Allowance on Bills for Frozen Pipes

Fort Worth, Tex.—The City Commissioners have authorized the Water Office to make an equitable reduction in bills this month of water users whose accounts show big excesses on account of bursted water pipes. Mayor W. D. Harris breathed a sigh of relief when the motion passed and all three Commissioners confessed that the recent cold snap caught them unprepared and that exposed pipes which froze and burst had made their own meters record an unduly large consumption of water.

Wires to Electric Pumping Station Break

Montreal, Que.—For thirty hours forty-five thousand people living in the suburbs were without water on account of the wires bearing the electric power being broken by tons of ice, the result of a sleet storm, which clung to them. Water was sold at 10 cents a bucket on being brought from the city mains in huge casks. Three hundred poles were torn to the ground by the iced wires.

Will Patrol Water Shed

Reading, Pa.—The Water Board has decided to employ men to patrol the water shed and protect the sources of the city's water supply.

Eight-Inch Leak Drains Reservoir into Sewer

Springfield, Mass.—One of the reasons why Springfield has not as much water in the Ludlow reservoir as might be wished is that up to last Saturday an eight-inch pipe was discharging "pure" Ludlow into the sewer at the corner of East Court and Market streets. The water may have been flowing only a short time and it may have been going on for ten years. The leak was discovered by a property owner who was making a house connection with a sewer. Tests were made of the water and it was found to be pure. The Sewer Department informed the Water Department of the big leak and it was closed.

STREET LIGHTING AND ELECTRIC POWER

Lower the Water at the Falls

Niagara Falls, N. Y.—The report of the International Waterways Commission shows that two American plants, by diverting 8,000 cubic feet of water a second, lowered the level of the Niagara River two-fifths of an inch over the American falls; that the two plants lowered the level of the river at Grass Island 3¼ inches; near the Ontario intake on the Canadian side, about 1¼ inches.

Railroad Will Light Crossings

Hartford City, Ind.—This city has an ordinance in regard to lighting railway crossings at the expense of the railroad that has held good, and as a result the Pennsylvania Railroad, through a representative, has agreed to pay the costs and a fine of $5 in each of the sixteen cases still on the docket for violation of the ordinance. The railroad company was ordered to place street lights at the railroad crossings at four streets in this city and refused to do so. A. M. Waltz, who was then City Attorney, had an ordinance drafted that required the same, and the railway company started in the Mayor's court and fought the cases through to the Supreme Court, but lost. The litigation has been watched with interest by municipalities all over Indiana, and a number of cities have had their attorneys copy the ordinance. The railway company's attorney endeavored to have the City Council dismiss all but one case, but the Council insisted that penalty be paid in each case. This will end a five years' battle with the company.

Municipal Ownership Figures Well

Bellefontaine, O.—The 150 arc lights used for lighting the streets of Bellefontaine and the sundry incandescent lights used for public buildings, parks and alleys did not cost the taxpayers of the city a cent during 1908. At lower rates than charged in cities near by, the receipts of the plant from commercial service last year were $12,000. The total disbursements, including the cost of street lighting and all public service, was but $10,000, which leaves a balance of $2,000 with which to pay the interest on the $50,000 bonds issued to construct the plant, which has been running about two years. Figuring the city's lights at the regular price in other cities, Bellefontaine saved $14,041 last year by owning her own electric light plant. The municipally-owned gas plant, besides paying all its own running expenses and making necessary extensions, paid into the sinking fund $6,500 to be used in paying bonds and interest against the plant. The bonds outstanding against the gas works amount to $27,000.

Plans Three Miles of Brilliantly Illuminated Streets

Newark, N. J.—Owing to the success which has attended the brilliant street illuminating by merchants in the South Broad street section of the Newark retail shopping district, two more organizations of business men have been formed and meetings will be held to arrange for similar permanent illumination of the northern section of Broad street and of the eastern and western sections of Market street. When this has been accomplished Newark will have the best lighted business section of public streets in the country, extending north and south on Broad street and east and west on Market street, a distance of about two miles on the former and about a mile on the latter, in the form of a cross and embracing the section of the city in which are located the theaters, newspapers, cigar stores, leading cafés and ice cream and confectionery establishments and restaurants. The movement is regarded as a commercial awakening of the city and the municipal authorities will do all they can to encourage it.

Will Improve, not Sell, Municipal Plant

Pasadena, Cal.—The city has rejected recent offer of the Edison Company to purchase the municipal lighting plant and has passed a resolution providing for an issue of $150,000 bonds to improve the plant. Arrangements have been made for a joint use of poles by the city and the company.

Rehearing Denied in New York Gas Case

New York, N. Y.—The U. S. Supreme Court at Washington on February 1 denied the petition of the Consolidated Gas Company for a rehearing of the case recently decided against it on the 80-cent gas rate law. The company claimed that the return of the rebate would amount to confiscation because the company did not make a 6 per cent, profit, counting the gas sold at 80 cents. There is over $9,000,000 being held by the courts and the rebates will now be paid consumers.

Municipal Power Proceeds

Winnipeg, Man., Can.—Winnipeg will proceed with the municipal hydro-electric power plant. After hearing the Winnipeg Electric Railway Company's final offers, as presented by D. D. Mann, the Civic Power Committee passed a resolution, moved by Mayor Evans, that the contracts already let by the Council for over $1,000,000 worth of work on the municipal power scheme be signed by the Mayor and the proper officials, and that the city is not prepared to accept the power contract offer made by the company. Now that the negotiations are ended and the contracts for the municipal power plant signed, the work will be pushed to as speedy a completion as possible. This decision by the Council seems to have the general approval of the citizens of Winnipeg, and the contractors for the work are now busy arranging the necessary preliminaries for the beginning of the work at once.

FIRE AND POLICE

An Innovation in Horse-Shoeing

Altoona, Pa.—In his recent message to Council Mayor S. M. Hoyer recommended the purchase of a wagon, equipped with forge and anvil and tools for horse-shoeing, and the employment of a man at $900 per annum to shoe the horses of the Fire Department, with the understanding that while not thus engaged he is to act as a fireman. If Councils adopt the idea, Chief Theo. Alleman will have the wagon hauled from station to station and the horse in the wagon will be exchanged for the horse on which the blacksmith is at work, so that the company will at all times have its full complement of horses and be ready to respond to any alarm as usual. The horses of the Fire Department are obliged to wait their turns when taken to the blacksmith shops and frequently are away from the stations as long as half a day, being thus liable to cripple the Department at a critical time. The horse-shoeing has heretofore cost about $300 per year.

Public Alarms Abandoned

Providence, R. I.—The Board of Fire Commissioners have voted to abolish outside fire alarms. It is believed that the discontinuance of the practice will result in the presence of much smaller crowds at the fires. As the Department is now on a fully paid, permanent basis, there are no call men to be summoned.

Work of Bicycle Police Squad

Washington, D. C.—In his report of the operations of the Police Department, Maj. Richard Sylvester, Superintendent of Police, took occasion to comment upon the value of the work of the bicycle squad. The worth of the member of the force on a bicycle as a police adjunct is emphasized by the returns to the District revenues by way of fines and forfeitures, he said, the amount of the receipts from this source alone during the last fiscal year having been $37,922.50, there having been 5,379 arrests. It is realized that the bicycle policeman is not a good form for detective service, but the regulating of motor, street car and other vehicle traffic, along the smooth streets and roads of the District must be had through this agency in order to have the support of the courts, who accept the reading of the mechanical contrivances known as the speedometer, one of which is attached to each police bicycle, as evidence where excessive speeding is charged.

Good Report of Auto Apparatus

Lansing, Mich.—In a recent letter in response to an inquiry from another city, Chief H. R. Delfs says the automobile recently purchased has been in service over six weeks and has answered alarms under all sorts of weather conditions. The machine has plowed through mud and snow, and has beaten the horses in every instance. In responding to an alarm the automobile fire apparatus traveled 19 blocks while the nearest hose company traveled five and the power-driven machine was the first to reach the blaze.

Year's Fire Loss in Philadelphia

Philadelphia, Pa.—An increase of 171 fires over 1907, with estimated losses of $2,278,252, an increase of $407,234, is shown by the report of the Fire Insurance Patrol. The total number of fires in 1908 was 3,512. A report also was made of various causes to which fires were assigned as follows: Defective flues, 124; electricity, 128; gas, 191; hot ashes, 84; matches, 790; smoking, 126; sparks from chimneys, etc., 538; spontaneous combustion, 127; stoves and ranges, 193; rubbish, 57; petroleum, 252.

New Police Electric System

Philadelphia, Pa.—A new system of electric motors which, when installed in the 37 police stations of the city, will revolutionize the present method of supplying current for operating the telegraph system of the Police Bureau, is the latest scheme of Chief McLaughlin, of the Electrical Bureau, to save the city many thousands of dollars annually. The Bureau Chief's plan is to secure the current necessary to operate the rather complicated machinery of the police telegraph system from that supplied the city for lighting purposes by the electric corporation. Small alternators will be placed in each station and connected to a socket in any convenient lighting wire, the alternating current of the lighting system being converted into the direct current needed for the police signal system. The change is estimated to save $10,000 a year.

GOVERNMENT AND FINANCE

Single Heads vs. Boards for Departments

Baltimore, Md.—In connection with a discussion of the question of the efficiency of boards acting in charge of departments, the following list, showing the departments presided over by single heads and by boards, has been prepared. In some cases, as, for example, the Sewerage Commission and the Topographical Survey, the board was organized to do specific work and will be abolished when the work is done. Single heads: City Engineer, City Library, City Collector, City Register, City Comptroller, City Surveyor, Street Cleaning, City Solicitor, Health, Building Inspection, Street Lighting, Superintendent Public Buildings, Collector of Water Rents. Boards: Water Department, Topographical Survey, Sewers, Jail, Harbor, Public Baths, Electrical Subways, Legislative Reference, Commissioners for Opening Streets, Finance Commission, Schools, Parks, Police, Fire Department, Agricultural Commission, Appeal Tax Court, City Charities. The general sentiment is the departments managed by a single head are the most efficient.

Uniform Accounting

Gloucester, Mass.—Edward S. Morse, lately with the Finance Commission in Boston, has been in Gloucester making arrangements for the installation of the new system of accounting as voted by the Municipal Council. Mr. Morse has completed a similar system of uniform accounting as recommended by the Bureau of Statistics in the city of Lowell. A new set of books will be necessary together with new forms of pay rolls, special warrants, etc., but when ready it is claimed will be so simple that a person of ordinary intelligence can ascertain at a glance the standing and expenditures of the various departments.

Will Reorganize Municipal Civil Service

Chicago, Ill.—Civil Service employees will hereafter be paid on the basis of what they do. The market price of labor in the commercial world will be the standard by which city employees will be paid. Men and women doing the same kind of service, or service of equal value, will receive checks of the same size. The purpose is to establish a sane system of equal justice and do away with the inequalities that have developed from political pull. Mayor Edward F. Busse is heartily for the new system, which Mr. Lower, President of the Civil Service Commission, says is the most important innovation undertaken in municipal affairs for a long time. There are about 18,000 persons in the classified service, and all of them will be affected except the police, the firemen and the school teachers, of whom there is an aggregate of about 12,000. Of the remainder Mr. Lower said that two-thirds of the persons under civil service are out of their grade. That means that about 4,000 employees will have a new title for their jobs or have their salaries changed, either up or down. The Civil Service Commission will adopt a rule establishing grade and rank of employees according to the duties performed. It will have another rule prohibiting the boosting of a salary above the grade to which the beneficiary belongs. It will make promotion of civil service employees possible only in their respective departments. After the grades are established the Finance Committee will fix the salaries for each grade after consultation with every department head.

Concord Seeks New City Charter

Concord, N. H.—Concord's new city charter has been presented to the Legislature. Following the lead of a number of cities of Massachusetts, it provides for a single Board of Aldermen and a Mayor to govern the city, and provides for the removal of all party designations on the ballot for the municipal elections. A direct non-partisan primary is provided for and the names will be placed on this primary ballot by petition only. Efficiency by centralization of power and responsibility is the aim of the framers of the new charter. The Legislative branch of the city is to consist of one Board—nine Ward Aldermen and six elected at large. These, with the Mayor, will constitute the city government. The Mayor and Ward Aldermen are to serve two years, three to be elected every two years. The Aldermen-at-large and the Mayor will constitute a Board of Public Works. All administrative officials will be appointed by the Mayor.

New Government Will Work Under Old Ordinances

Haverhill, Mass.—If the advice of City Solicitor Nichols is carried out the Municipal Council will be in no haste to pass revised city ordinances to conform with the new charter, but will rather work under an order drawn up to conform to the ordinances as they will later be revised. This will give the Council opportunity to have a practical work-out of the ordinances before they are enrolled, and if by any chance the division of the department into arbitrary sections as proposed, such as the Department of Public Charities, Department of Streets, Sidewalks and Bridges, Department of the Public Health, and likewise, should prove to work disadvantageously, then a change could be made before they were embodied into ordinances which are difficult to change.

Memphis Charter Bills Pass Senate

Memphis, Tenn.—The two bills commonly known as the Memphis charter bills have passed the Senate by practically a unanimous vote. They are companion bills. The bill providing for a commission form of government for Memphis passed unanimously, with the exception of Senator Kimbrough, who voted against it. The bill providing for the recall of officials under this form of government passed with three dissenting votes, Senators Kimbrough, Neal and Cummings.

New Charter Recognizes Political Parties

Huntington, W. Va.—A charter has been prepared for the approval of Legislature which authorizes the creation of a Board of Affairs to be composed of four men. No three of these men can be members of the same political party. Presumably two of the members will be Republicans and two Democrats. The member receiving the highest number of votes will be Mayor in addition to being a Board member. The Board of Affairs is empowered to pass ordinances and adopt rules and regulations for the various city departments, and the Mayor has almost absolute executive control, besides having a vote and a voice in the making of ordinances. Another body is provided for the Citizens Assembly. This is to be composed of 60 members. The Assembly has supervisory powers over the Board of Affairs.

Demand Recall Election to Oust Mayor

Los Angeles, Cal.—At the instance of the Municipal League, of which J. O. Koepfli is president, petitions are being circulated requesting that a special election be held at which the question of recalling Mayor A. C. Harper from office be decided. Signatures of 8,000 voters, 25 per cent. of the number recorded at the last election, will be required. The present Mayor will remain in office unless a majority of voters decides against him. The cause of the action of the League was the appointment by the Mayor of Chief of Police Edward Kern to the position of a member of the Board of Works, and upon allegations of vice protection in the city under his administration. It is charged that he associated himself in business corporations with proprietors of saloons and others seeking favors at his hands, and that they secured unlawful concessions and advantages.

Good Report of Civil Service Commission

Portland, Ore.—With few exceptions there has been a hearty co-operation of the heads of the various municipal departments in perfecting and maintaining the merit system of the city. This is the statement made in the annual report of the Municipal Civil Service Commission submitted to Mayor Harry Lane. The report goes on to say that great care has been taken to have all examinations fair and practical, and that every effort has been made to give each candidate for a position an equal chance with all other candidates. During the year several new classifications have been added to the list, on request of the departmental heads. The scopes of the examinations for the various branches of the city's service have been made more practical and embrace all the requirements necessary to guarantee eligibles competent to perform the duties of the positions vacant. During the year there were 1,220 applications filed for positions. Of this number 936 took the examinations and 507 passed, while 392 failed.

Borough President Lectures on Local Government

St. George, S. I., N. Y.—A new departure in Staten Island affairs was started when the first of a series of lectures was given by Borough President George Cromwell in the board room of the Borough Hall, St. George. These lectures will be given monthly, when all citizens will have explained to them the public work done on Staten Island in all departments of the borough. It is hoped to enlist the co-operation of the departments not embraced by law in the office of the Borough President, such as taxes, water supply, gas and electricity, health, tenement house, police, fire and others. It is expected they will accept invitations to explain to the taxpayers at these meetings what the taxes are used for on Staten Island.

Contract Board Organized

Washington, D. C.—A new department of the District government, a Contract Board has been formed with D. E. Garges, Chief Clerk of the Engineering Department, as Chairman. The Board will have charge of the preparation of all forms of contracts and will have custody of the documents. The work of the Board will simplify and facilitate business.

REFUSE COLLECTION AND DISPOSAL

Beaumont Passes Garbage Ordinance

Beaumont, Tex.—Mayor E. A. Fletcher has signed the new garbage ordinance which makes it unlawful for anyone hereafter to transport garbage through the streets except in water-tight receptacles. Violations of the ordinance are punishable by a fine not to exceed $25.

"Garbage" Cards Become Popular in Lexington

Lexington, Ky.—Chairman W. M. Bateman, of the Board of Public Works, has given out a large number of new "Garbage" cards to the householders. These are large white cards bearing in huge red letters the word "Garbage." The cards are to be hung out in front of the residence when the owner wishes the garbage can emptied. In this way the unsightly, malodorous can will be kept in the rear of the house off the street, and at the same time the householder will save himself the trouble of carrying the heavy can out to the sidewalk and back again since the garbage collector now has instructions to attend to that.

Delay in Building Incinerator Makes Trouble

San Jose, Cal.—The garbage situation is so serious, owing to the inability of collectors to secure dumping ground, that Mayor Davison has sent Council a special message asking them to take immediate action. At the time the message was submitted no garbage had been hauled from the city for four days. The Mayor favors some temporary expedient, such as burying the garbage within the city limits, until arrangements can be made for a bond issue and the construction of an incinerator.

Snow Removal in Washington

Washington, D. C.—The recent snowstorm and the failure of the District officials to clear the streets was the cause of considerable inconvenience to citizens and many complaints. It seems that the wording of the law prevents the use of appropriations for street cleaning from being used for snow removal. An attempt to wash snow into the sewers with water from the fire hydrants only resulted in blocking up the inlets to the sewers. After the snow had lain on the ground for a few days, and after conferences between District officials and Congressional committees, what was left was removed on the ground that, as it was half dirt, the work might be classed as street cleaning.

RAPID TRANSIT

Cortlandt Street Tunnel Through to Jersey Shore

Jersey City, N. J.—The two ends of the south tunnel leading from Jersey City under the Hudson river to Cortlandt street, New York, were joined January 27. A party of officials of the Hudson & Manhattan Railroad Company went from New York to Jersey City, walked down in the tunnel toward New York, witnessed the last shot fired that completed the connection, stepped through the opening and continued on to New York. It is announced that the tunnels will be in operation by July 1.

All-Night Car Service for Utica

Utica, N. Y.—The Public Service Commission, Second District, has received a petition from a large number of citizens of Utica, asking for an order directing the Utica & Mohawk Valley Railway Company to institute and maintain the service of its cars in the city of Utica during the hours between midnight and 6 o'clock in the morning.

Interstate Commission Would Resign Local Duties

Washington, D. C.—The Interstate Commerce Commission in a special report to Congress on the street railway situation in the District says that their experience with the problem leads them to the conclusion that it is advisable for the Congress to vest the duties imposed on the commission by the act of May 23, 1908, in a commission or body more closely identified with the District of Columbia and which will be enabled to give more immediate attention to the problem of street car service in the District.

Two Rates of Fare in Cleveland Now

Cleveland, O.—On February 1 street car fares on the lines on which the Cleveland Electric Company owns the franchises were raised to five cents, in accordance with orders from the court. The Municipal Traction lines will still be operated for three cents. Some transfer privileges were cut off and the routes of some of the through lines were altered because of the different rates of fare on the lines. This will result in increased number of blockades, as nearly all the cars will turn at the Square instead of running through from one end of the city to the other, as they have been doing in the last few months. It is believed that Mayor Tom Johnson still intends to fight for possession of the old three-cent lines and hopes to add to them several important lines on which the Cleveland Electric Company's franchise will soon expire.

Electrification of Buffalo Terminal Lines

Buffalo, N. Y.—Alderman Fisher has offered a resolution to the Council of Buffalo for the adoption of an ordinance that shall provide for the electrification of all the railroad lines now operated by steam within the city limits.

Year's Work of New York Railroads

New York City, N. Y.—A complete survey of transit conditions in Greater New York is the substance of the report of the public service commission of the first district, for the year ended December 31, 1908. The document is in three volumes, of which the first is a history of the commission's work and the results. The other two contain copies of the commission law, the rapid transit act, statistics and reports of companies and a complete list of the opinions, decisions and orders of the commission from July 1, 1907, to December 31. The general subject of public utilities is prefaced by this statement. The surface, elevated and subway companies in New York City carry annually more than 1,300,000,000 passengers, which is 66 per cent. more than the total number of passengers carried on the steam railroads of the entire country. These companies have a capitalization of about $533,000,000, and derive annually from their passengers more than $62,000,000. The gas and electric companies have a capitalization of $386,000,000 and the amount of gas sold annually is 32,000,000,000 cubic feet, which is more than 20 per cent. of the entire gas production in the United States. The income from the sale of electricity in the city is about $20,000,000. Discussing rapid transit the commission says: More than $50,000,000 has already been expended by the city to build subways. The Fourth Avenue subway, the Broadway-Lexington Avenue system, the loop lines and the Canal street extension as planned by the commission will involve additional expenditure of about $100,000,000. These rapid transit plans or routes, in addition to any extension planned by the existing companies, are considered imperative by the commission. Even these will not fully relieve the congestion that now exists, not to mention the future increase in traffic.

During the last year the number of accidents on the steam, subway, elevated and surface railroad lines of this city reached a total of 56,481, and 444 persons were killed. The largest number of accidents were caused by the surface cars. The fatal accidents on the surface lines numbered 248, on the subway and elevated lines 80 and on the steam railroads within the city boundaries 107. Out of the total number of accidents of all kinds for the year the surface roads were responsible for 42,391. With a view to decreasing the number of accidents, the Public Service Commission has made an elaborate series of tests of street car fenders and has issued a report, which gives a list of fenders and wheel guards which obtained an average of at least 75 per cent. of good results. The report concludes with the recommendation that all cars throughout the greater city be equipped with automatic wheel guards and that cars operating in districts not congested be equipped with projecting fenders.

MISCELLANEOUS

No Group Picture of Aldermen

Boston, Mass.—Mayor George A. Hibbard has vetoed an order passed by the Board of Aldermen providing for the printing of the pictures of the 1908 members, and also a group picture of the members and the officers of the Board in the closing proceedings of the Board, as a public document. The Mayor does not object to the printing of the closing proceedings, but he does find fault with that part concerning the pictures, as the cost of the work in the past—about $1,000—has been exorbitant.

Can Sell Short Weight

Birmingham, Ala.—The City Council has settled the agitation in reference to giving the merchants of Birmingham the right to sell customers short weight in flour and meal. This agitation was begun by the merchants several months ago, and was strenuously opposed by A. J. Hall, City Inspector of Weights and Measures. He claims that to recognize a two per cent. shrinkage would be equivalent to allowing unscrupulous merchants persistently to give short weights, and thus enable them apparently to undersell other merchants. The Council decided to permit the sale of meal and flour with an allowance of one per cent. for skrinkage. Whether Mayor Ward will sign this is problematical, as the claim is made that the millers themselves ask for a shrinkage allowance of only ½ per cent.

For New City Hall

Boston, Mass.—The big automobile fire, in which nearly 400 valuable machines were destroyed, will be investigated by the State Police, with the idea of learning whether its origin was incendiary. It is the intention of State Police to ask the Legislature for more stringent laws in relation to the construction and use of buildings for automobiles. Mayor Hibbard says that the wiping out of the buildings in Park square had cleared the way for the building of a new City Hall and the land should be acquired at once.

Railroads Hold Two Miles of Lake Front; Want More

Cleveland, O.—The railroads which enter the Union Station are desirous of building a new and handsome station and will need to acquire for station and yard some thirty-five acres of land, including portions of Lake View Park, as well as portions of the lake front. The railroads already hold about two miles of the lake front. The riparian rights of the city are not clearly determined and Mayor Johnson is inclined to fight for them before giving the railroads any more privileges. It has been suggested that an informal referendum vote be held as to whether to give the railroads the new privileges and fight for the riparian rights later or to refuse the concessions until some understanding is reached about the rights.

Kills Moth Appropriation

Nashua, N. H.—The Common Council has voted down a resolution appropriating $1,000 for the work of extermination of brown-tail moths. Members of the Council say the city of Nashua is now liable to a fine of $15,000 from the State for refusing to take up the work.

Advocates Public Baths in School Buildings

Providence, R. I.—A partial solution of the public bath question in Providence is suggested in the annual report of the Inspector of Plumbing, Reuben S. Bemis. Mr. Bemis suggests inquiry as to the practicability of locating shower baths for public use in the basements of some of the school buildings. This proposition has the merit of simplicity and calls for an outlay which may be considered nominal in view of the results to be obtained. Not a cent need be appropriated for land or buildings; the city now owns the school houses, which are provided with water and sewer connections and steam apparatus which may be used for heating water for the shower baths.

LEGAL NEWS

Summary and Notes of Recent Decisions—Rulings of Municipal Interest

CONTRACTS—LOWEST BIDDER

Attorney-General vs. **Public Lighting Commission of City of Detroit.**—A bill filed by the Attorney-General on the relation of a competitive bidder against city authorities is a proper proceeding to determine the legality of their action in accepting a proposal submitted privately after sealed proposals, advertised for as required by the charter, had been received and opened, the public being the real complainant, and the issue is not one between adverse litigants to determine their respective rights. Where sealed proposals for furnishing machinery were advertised for by a city commission as required by the charter, and, after proposals received under the advertisement had been opened and considered, an individual proposition reducing a bid was submitted privately by a bidder who had joined with another in submitting a joint proposal under the advertisement, the action of the commission in accepting the individual proposition was in effect a rejection of all proposals received under the advertisement, and was a private contract prohibited by the charter. By receiving bids under advertisements' city authorities give their construction of the charter requiring the same that it does extend to cases of machinery, materials and property of which the seller has a monopoly, and which the authorities consider the best obtainable. The object of provisions in a city charter requiring contracts to be let to the lowest bidder is to prevent favoritism, corruption, extravagance and improvidence in awarding contracts, and such provisions should be so construed as fairly and reasonably to accomplish such purpose. The provision of the charter of the city of Detroit requiring contracts to be let to the lowest bidder applies to a contract for the purchase of patented machinery required for the city's electrical generating plant.—Supreme Court of Michigan.

CONTRACTOR'S CLAIM FOR WORK

Thornton vs. **City of East Grand Forks.**—Action to recover for work and materials done and furnished by the plaintiff's assignor for the defendant, in the execution of a paving contract, as evidenced by estimates allowed and issued by the defendant's engineer and Common Council. Held, that the plaintiff's alleged cause of action accrued on the tenth day of the month next after the estimates were allowed and issued, that the time limit of the statute of limitations applicable to this case is two years; further, that it conclusively appears upon the face of the complaint that this action is barred.—Supreme Court of Minnesota.

SEGREGATION OF TOWN'S TERRITORY

State ex rel. City of Minot et al. vs. **Willis et al.**—Under the facts stated in the opinion, held that the city of Minot is estopped by its long acquiescence from questioning the validity of the method adopted by the Council in attempting to segregate certain territory from its corporate limits.—Supreme Court of North Dakota.

SMOKE INSPECTOR—CIVIL SERVICE

People ex rel. Plotke vs. **Lower et al.**—A statute will be given a prospective operation only unless its language is so clear that it will admit of no other than a retroactive construction. Under the civil service act regulating the civil service of cities, and providing that the head of each principal department of the city government shall not be included in the classified service, and the city and village act authorizing the City Council to provide for the appointment of officers, the office of chief smoke inspector of the city of Chicago, created in 1907, and made the head of a principal department of the city government for the inspection and abatement of smoke, is not included in the classified service, the city civil service act not operating retroactively so as to apply only to the heads of such principal departments of the city government as existed at the time of its adoption.—Supreme Court of Illinois.

CONDEMNATION AND DESTRUCTION OF FOOD

North American Cold Storage Company, Appellant, vs. City of Chicago et al.—Due process of law is not denied the owner or custodian of food in cold storage by a municipal ordinance under which such food, when unfit for human consumption, may summarily be seized, condemned and destroyed by municipal officers without a preliminary hearing.—United States Supreme Court.

DEFECTIVE STREET—DEFECTIVE NOTICE

Purdy vs. **City of New York.**—Under Laws 1886, providing that cities having a population of 50,000 or over shall not be liable for injuries unless notice "of the time and place at which the injuries were received" is served on the corporation counsel, a notice that plaintiff was injured "whilst walking along the sidewalk on M street, Borough of Brooklyn," by falling into an "opening, gully, or trench running across said sidewalk," did not sufficiently designate the place of the accident, it appearing that M street is at least a mile long. The act of the corporation counsel of a municipality in failing to return a notice required by Laws 1886, to be given to such corporation counsel as a condition precedent to the liability of the municipality for injuries, does not amount to a waiver of defects in such notice.—Court of Appeals of New York.

STREET OBSTRUCTION—CONSTRUCTIVE NOTICE

Orser vs. **City of New York.**—In an action against a city for injuries caused by tripping over a loose stone in the street, the evidence of the only witness relied on to prove constructive notice to the city of the presence of the obstruction, that during a period of two or three weeks before the accident he had seen a loose stone of like character as the one tripped over in the general locality, but not at the precise place where the injury occurred, that during most of the time the stone was near a telegraph pole where it was not dangerous to travelers, and that on one occasion he had removed the stone from the street to a place near the pole, was insufficient to show that the city had constructive notice of the unlawful obstruction in the street, as the stone only became an unlawful obstruction as regards plaintiff when in the street.—Court of Appeals of New York.

ASSESSMENT ORDINANCE—SUFFICIENCY

Village of Donovan vs. **Donovan et al.**—An estimate of the cost of a system of water mains with hydrants which included the cost of labor and material necessary to properly lay, connect, and place in position the pipes, hydrants, etc., and was so itemized that an experienced contractor could, from the data furnished, determine the cost of items omitted from the estimate, was sufficiently itemized. In an ordinance providing for a system of water mains, mistakes in designating streets in which the mains are to be laid are not ground for refusing confirmation of an assessment for the cost of the improvement, where the location of such streets is made certain by parol evidence.—Supreme Court of Illinois.

COMPELLING ATTENDANCE OF ALDERMAN

City of Earlville vs. **Radley.**—A municipal corporation has only such powers as has been granted to it by the Legislature, and it can legislate only because it is authorized to do so by the State. While the burden of the office of Alderman provided for by statute is imposed by law on each person elected, and he must, as stated in the oath required of him, faithfully discharge the duties of the office to the best of his ability, the Legislature has not by any general enactment provided a penalty for neglect of duty except by Hurd's Revised Statutes, 1905, which imposes a fine on and authorizes the removal from office of every person guilty of any palpable omission of duty. City and Village Act, providing that the City Council shall determine its own rules of proceeding, punish its members for disorderly conduct, and that a majority of the Aldermen elected shall constitute a quorum, but a smaller number may adjourn and may compel the attendance of absentees "under such penalties as may be prescribed by ordinance," do not authorize a City Council to adopt an ordinance imposing a penalty on a member absenting himself from any of the meetings unless for good reason he shall be excused by the Council, since the ordinance has no tendency to aid the minority in compelling the attendance of absentees.—Supreme Court of Illinois.

CITY LIABILITY FOR ASSESSMENT FUNDS

Conway vs. **City of Chicago.**—Funds collected by a city from a special assessment levied for the payment of a public improvement constitute a trust fund to pay for the improvement, and the city has no right to transfer them to other funds and draw on them indiscriminately for pay rolls of inspectors, engineers and other officers and employees of the special assessment department without regard to the improvement as to which the services were rendered or expenses incurred, and, if the city may properly pay out of such funds the necessary expenses for inspection and engineering incurred in connection with the improvement, it cannot appropriate more than is necessary for such purpose.—Supreme Court of Illinois.

THE MUNICIPAL INDEX

In Which Are Listed and Classified by Subjects All Articles Treating of Municipal Topics Which Have Appeared During the Past Month in the Leading Periodicals

It is our purpose to give in the first issue of each month a list of all articles of any length or importance which have appeared in all the American periodicals and the leading English, French and German ones, dealing more or less directly with municipal matters. The index is kept up to date, and the month of literature covered each time will be brought up to within two or three days of publication. Our chief object in this is to keep our readers in touch with all the current literature on municipal matters. In furtherance of this we will furnish any of the articles listed in the index for the price named after each article; except that where an article is continued in two or three issues of the paper, the price given is for each of said issues. In addition to the titles, where these are not sufficiently descriptive or where the article is of sufficient importance, a brief statement of its contents is added. The length also is given, and the author when it is a contributed article.

ROADS AND PAVEMENTS

Good Roads in the South. By Joseph Hyde Pratt. 1 1-2 pp., Manufacturers' Record, Jan. 7. 10 cts.

Value of Good Roads. Paper before International Good Roads Congress. By Lord Montague. 1 p., Surveyor, Jan. 8. 20 cts.

Good and Bad Roads. From Bulletin of Missouri State Board of Agriculture. 3 pp., Good Roads, January. 10 cts.

Highways of New England, Trunk Line. Addresses before conference of Governors. By Harold Parker and J. H. McDonald. 6 pp., Good Roads, January. 10 cts.

Future Highway. Paper before International Road Congress. By H. A. Van Alstyne. 1 p., Surveyor, Jan. 8. 20 cts.

Standard Details for Highway Construction. 1 1-2 pp., Engineering-Contracting, Jan. 6. 10 cts.

Ideal Construction of Public Roads. Address before Good Roads Convention, Atlantic City, N. J. By G. C. Diehl. 1 1-2 pp., Good Roads, January. 10 cts.

General Figures on the Cost of Road Construction in Various Parts of the United States. From report of M. O. Eldredge before International Road Congress. 2 pp., Engineering-Contracting, Dec. 23. 10 cts.

Management, Modern Road. Paper before International Road Congress. By E. Purnell Hooley. 1 1-2 pp., Good Roads, January. 10 cts.

Systems of Highway Administration Compared: Their Influence on Cost and Efficiency. By W. Rees Jeffreys. 4 1-2 pp., Surveyor, Dec. 25. 20 cts.

Preservation of Park Roads. Paper before International Road Congress. By Chas. S. Brownell. 1 p., Surveyor, Jan. 8. 20 cts.

International Road Congress, Report on. By N. P. Lewis. Illustrated, 4 pp., Engineering News, Jan. 21, 15 cts.

Some Lessons of the International Road Congress. 1 1-3 pp., Engineering Record, Jan. 23. 10 cts.

International Road Congress—Belfast Deputation's Report. 1 p., Surveyor, Jan. 1. 20 cts.

International Road Congress. Report of Consul-General F. H. Mason. 3 pp., Daily Consular and Trade Reports, Jan. 5. 10 cts.

Some Impressions of the International Road Congress. By A. Gladwell. 1-2 p., Surveyor, Jan. 1. 20 cts.

Dust Preventives. From Bulletin of U. S. Department of Agriculture. By Prevost Hubbard. 2 1-2 pp., Surveyor, Dec. 25. 20 cts.

Selection of Dust Preventives. From Bulletin of U. S. Office of Public Roads. By Prevost Hubbard. 2 pp., Engineering-Contracting, Dec. 30. 10 cts.

Method for Determining Number of Dust Particles in Air. Paper before American Public Health Association. 1-3 p., Engineering News, Dec. 31. 15 cts.

Oil Emulsion Patent Decision. Decision in suit of Westrumite Company against Lincoln Park Commissioners, declaring patent claims invalid. 1-2 p., Municipal Journal and Engineer, Jan. 13. 10 cts. 2-3 p., Engineering-Contracting, Dec. 23.

Road Tars, Examination of. Account of work in England as presented to the International Road Congress. 1 1-2 pp., Municipal Journal and Engineer, Jan. 6. 10 cts.

Examination of Tars for Use on Roads. From articles by Clayton Beadle and Henry P. Stevens in Surveyor. 2 1-2 pp., Engineering-Contracting, Jan. 13. 10 cts.

Bitulithic, Decision Concerning. Warren Bros. vs. City of Owosso, U. S. Circuit Court of Appeals, sustaining three claims of the bitulithic patent. 1 p., Municipal Journal and Engineer, Jan. 27. 10 cts.

Mineral Rubber Pavement. From paper before American Society of Municipal Improvements. By Linn White. Illustrated. 3 pp., Municipal Engineering, December. 25 cts.

Asphalt-Testing — Penetration. Discussion of methods of making the test and its value in comparing different asphalts. By Harry Tipper. Illustrated. 2 1-2 pp., Municipal Journal and Engineer, Jan. 6. 10 cts.

Value of Carbene Requirement in Asphalt Specifications. By L. Kirschbaum. 3 pp., Municipal Engineering, December. 25 cts.

Old and New Methods of Asphalt Paving. By G. B. Grant. 2 pp., Municipal Engineering, December. 25 cts.

Paving Plant at Portland, Ore. Description of large plant for making bitulithic. Illustrated. 1 1-2 pp., Municipal Journal and Engineer, Jan. 6. 10 cts.

Cost of Asphalt Work in New Orleans. Account of the operation of the Municipal Asphalt Plant at New Orleans, La. 1-3 p., Municipal Journal and Engineer, Jan. 10. 10 cts.

Asphalt Repairs, Hot Air Blast for. 1-4 p., Municipal Journal and Engineer, Jan. 27. 10 cts.

Concrete Pavement, Blome. From paper before American Society of Municipal Improvements. By H. S. Dewey. 3 pp., Municipal Engineering, December. 25 cts.

Use of Cement in Road and Bridge Building. 2 1-2 pp., Good Roads Magazine, January. 10 cts.

Standard Specifications for Portland Cement Roads and Portland Cement Sidewalks. 1 2-3 pp., Engineering-Contracting, Jan. 20. 10 cts.

Concrete Paving in Salt Lake City. 1-4 p., Municipal Journal and Engineer, Jan. 27. 10 cents.

Brick, Improved Paving. Wire Cut Brick. Illustrated, 2 1-2 pp., Brick, January. 10 cts.

Wood Preservation by the Open-Tank Process. Paper before Association of Railway Superintendents of Bridges and Buildings. By Ernest F. Hartmann. Illustrated, 3 pp., Engineering News, Dec. 31. 15 cts.

Street Paving in Detroit. Description of "petition" and "forced" paving procedure. 2-3 p., Municipal Journal and Engineer, Jan. 6. 10 cts.

Small Cubes for Road Paving. Abstract of paper before Rochester Engineering Society. By J. Y. McClintock. 2-3 p., Municipal Journal and Engineer, Jan. 6. 10 cts.

Gladwell System of Paving. Description of a patented method of treating roads with tar, in successful use in England. 1-4 p., Municipal Journal and Engineer, Jan. 20. 10 cts.

Sand Clay Road. Address before Roads School, Waterloo, Ia. By W. L. Spoon. Illustrated, 6 pp., Iowa Engineer, November. 15 cts.

Binding Material, A New. A waste product of sulphite pulp manufacture. Used for dust laying in Germany. 1-4 p., Municipal Journal and Engineer, Jan. 13. 10 cts.

Assessments and Collections in Detroit, Pavement. Paper before League of American Municipalities. By E. R. Schreiter. 2 pp., Municipal Engineering, December. 25 cts.

SEWERAGE AND SANITATION

Sewerage System, Baltimore. By Littell McClung. Illustrated, 3 pp., Municipal Engineering, January. 25 cts.

Construction of the Bronx Valley Sewer. Illustrated, 3 pp., Engineering Record, Jan. 9. 10 cts.

Glasgow Sewage Scheme. Shieldhall Outfull Works. 1-2 p., Surveyor, Jan. 1. 20 cts.

Sewer Joints, Asphalt, at Monmouth, Illinois. By J. S. Bates. Illustrated, 1 p., Engineering Record, Jan. 9. 10 cts.

Tight Joints In Pipe Sewers. Paper before American Society of Municipal Improvements. By B. E. Briggs. 2 pp., Municipal Engineering, December. 25 cts.

Concrete Sewer Construction in Chicago. By Frank C. Perkins. Illustrated. 2 1-2 pp., Municipal Engineering, January. 25 cts.

Building a Reinforced Concrete Pipe Sewer. By A. J. Taylor. 2 1-2 pp., Municipal Engineering, January. 25 cts.

Durability of Cement in Sewers. Communication from Chas. W. Campbell. 1-2 p., Municipal Journal and Engineer, Jan. 6. 10 cts.

Cost of 66-inch Brick Sewer at Gary, Ind. By E. M. Scheflow. 3-4 p., Engineering Record, Jan. 2. 10 cts.

System of Collecting Cost Data with Particular Reference to a Sewer Contract. Illustrated, 3 pp., Engineering-Contracting, Jan. 13. 10 cts.

Trench Excavation. Legal decision regarding payment when unexpected conditions are found. 2-3 p., Engineering Record, Jan. 2. 10 cts.

Pollution of Water in Relation to Its Effect on Fish. By E. A. Letts. 5 pp., Water, December. 20 cts.

River Pollution in Pennsylvania. Plans of the State Board of Health. 1-2 p., Municipal Journal and Engineer, Jan. 27. 10 cts.

Massachusetts State Board of Health on Pollution of Boston Harbor from the Moon Island Outlet of the Boston Sewerage System. 1-2 p., Engineering News, Dec. 31. 15 cts.

Sewage Discharge into Tidal Waters. Comment on an appendix to the Fifth Report of the Royal Commission on Sewage Disposal. 1-2 p., Municipal Journal and Engineer, Jan. 6. 10 cts.

Sewage Disposal, Practical Sewerage and. By H. C. H. Shenton. 1-2 p., Local Government Journal, Dec. 26. 10 cts.

Sewage Purification Abroad. Review of present conditions in England and Germany. From paper before Boston Society of Civil Engineers. By H. W. Clark. Illustrated, 4 pp., Municipal Journal and Engineer, Jan. 27. 10 cts.

Sewage Purification Abroad. From paper before Boston Society of Engineers. By H. W. Clark. Illustrated, 1 p., Fire and Water, Jan. 13. 10 cts.

Sewage Purification in Hamilton, Ont. By E. G. Barrow. Illustrated. 2 pp., Canadian Municipal Journal, January. 15 cts.

Sewage Disposal at Fishery. Illustrated, 2-3 p., Surveyor, Jan. 1. 20 cts.

Sewage Purification vs. Water Filtration. Paper before American Society of Municipal Improvements. By George C. Whipple. 2 1-2 pp., Municipal Journal and Engineer, Jan. 6. 10 cts.

Purification of Water or Sewage. Comment on comparative importance. 1-3 p., Municipal Journal and Engineer, Jan. 6. 10 cts.

Purification of Sewage. Translation of Fifth Royal Report. 4 pp., Technique Sanitaire, December.

Some Laboratory Experiments for the Biological Treatment of an Acid Sewage. By A. H. Fardon, 14 pp., Journal of Preventive Medicine, January. 60 cts.

Hampton Doctrine in Relation to Sewage Purification. By W. Owen Train. 2 1-2 pp., Surveyor, Dec. 25; 3 pp., Jan. 1. 20 cts.

Sprinkling Filters at Hamilton, Ont. 1-3 p., Municipal Journal and Engineer, Jan. 27. 10 cts.

Disinfecting Sewage Effluents. Account of the operation of a testing plant at Baltimore, Md., where Chlorine is used. 2-3 p., Municipal Journal and Engineer, Jan. 20. 10 cts.

Standard Sewage Effluent. Abstract of Report of Royal Commission on Sewage Disposal recommending local standards of purification. 3-4 p., Municipal Journal and Engineer, Jan. 13. 10 cts.

House Drainage, Modern. By John Lawrence. 1-3 p., Local Government Journal, Jan. 16. 10 cts.

Intercepting Traps, To Abolish. Report of commission regarding joint trunk sewer in Orange, N. J., and other municipalities. 1-2 p., Municipal Journal and Engineer, Jan. 6. 10 cts.

Sanitary Law. Paper before Institute of Sanitary Engineers. 2 pp., Municipal Journal, Dec. 25. 15 cts.

International Office of Public Hygiene—its inauguration at Paris, France. 6 pp., Public Health Reports. 10 cts.

Relation of Mayors and Township Clerks to the State Board of Health. By A. P. Hanchett. 2 pp., Midland Municipalities, January. 10 cts.

Milk Ordinance of Marshalltown, Ia. 2 pp., Midland Municipalities, January. 10 cts.

Oyster Question. Discussion of condition of oysters as sold in inland cities. By H. E. Barnard. Illustrated, 2 pp., Bulletin Indiana State Board of Health, November. 10 cts.

Plague Infection in Squirrels. 4 pp., Public Health Reports, Dec. 25. 10 cts.

Comfort Station, Atlantic City. Description of a station built on the ocean side of the boardwalk. Illustrated, 2 pp., Municipal Journal and Engineer, Jan. 6. 10 cts.

WATER SUPPLY

Water Supply of Hythe, Kent. By Chris Jones. Paper before Association of Water Engineers. 1 p., Contract Journal, Dec. 30. 20 cts.

Heywood and Middleton Water Scheme. 2 1-2 p., Illustrated, Surveyor, Jan. 1. 20 cts.

Ashworth Moor Water Supply Scheme. Illustrated, 2 pp., Contract Journal, Jan. 6. 20 cts.

Washington Water Works. Recommendations of Gen. Marshall. 1-4 p., Municipal Journal and Engineer, Dec. 2. 10 cts.

Glance at the Water Supply of Philadelphia. Paper before New England Water Works Association. By John C. Trautwein. 23 pp., Journal of Association, December. $1.

Municipal Water Works of Haverhill, Mass. Paper before New England Water Works Association. By A. L. Sawyer. 2 1-2 p., Municipal Engineering, January. 25 cts.

Poughkeepsie Water Works. Account of the operation of the new filtration plant. 3 1-2 pp., Municipal Journal and Engineer, Jan. 20. 10 cts.

Water Supply of Salt Lake City. Illustrated. 1 1-3 pp., Fire and Water, Jan. 19. 10 cts.

Character of Water Supply of Michigan City, Ind., Method of Investigation of, 2 1-2 pp., Municipal Engineering, January. 25 cts.

Bacteriological Analyses of New York Water. 1-3 p., Fire and Water, Jan. 6. 10 cts.

Purification Plants, Importance of the Proper Operation of Water. Paper before American Society of Municipal Improvements. By George W. Fuller. 2 pp., Municipal Engineering, December. 25 cts.

New Covered Filters for Yonkers, N. Y. Illustrated, 2 1-3 pp., Engineering Record, Jan. 16. 10 cts.

Electrically Operated Filter Valves at Cincinnati, O. By F. H. Stephenson. Illustrated, 1 p., Engineering Record, Jan. 16. 10 cts.

Water Resources, Conservation of. Paper before New England Water Works Association. By M. O. Leighton. 7 pp., Journal New England Water Works Association, December. $1.

To Store Water in New York State. Abstract of Legislative bill. 1-2 p., Fire and Water, Jan. 13. 10 cts.

Forest Conservation. Paper before New England Water Works Association. By R. S. Kellogg. 5 pp., Journal New England Water Works Association, December. $1.

Effort to Regain Control or at least Determine State Water Rights in New Jersey. 1-2 p., Engineering News, Dec. 31. 15 cts.

Control of Water Powers. 2-3 p., Engineering Record, Jan. 23. 10 cts.

Rainfall, Measurement of. Paper before Association of Water Engineers. By Hugh Robert Mill. 1-3 p., Contract Journal, Dec. 23. 20 cts.

Stream Flow Data. Paper before New England Water Works Association. By Charles E. Chandler. 10 pp., Journal New England Water Works, December. $1.

Wells, Stovepipe. Account of a method of sinking wells employed by the Board of Water Supply of New York. Abstract of paper before Municipal Engineers of Greater New York. By Walter E. Speer. 1 1-2 pp., Municipal Journal and Engineer, Jan. 13. 10 cts.

Reservoir, Progress of the Ashokan. Illustrated. 1 1-2 pp., Engineering Record, Jan. 16. 10 cts.

New High-Pressure Reservoir of the Baltimore Water System. Illustrated, 1 1-3 p., Engineering Record, Jan. 23. 10 cts.

Failure under Test Load of a Reinforced Concrete Reservoir, Annapolis, Md. By R. H. Danforth. Illustrated, 1 p., Engineering News, Jan. 14. 15 cts.

Rolling Tampers for Embankments. Account of experience at Berkeley, Cal. 1-4 p., Municipal Journal and Engineer, Jan. 20. 10 cts.

High Timber Dams in California. By E. M. Chandler. Illustrated, 2 1-2 pp., California Journal of Technology, November.

Water Tower, Reinforced Concrete, for the Atlantic Compress Co., Atlanta Ga. Detailed description. By R. B. Tufts. Illustrated, 1 p., Engineering Record, Jan. 2. 10 cts.

Novel Reinforced-Concrete Tower and Tank. By R. B. Tufts. Illustrated, 1 p., Engineering News, Jan. 7. 15 cts.

Aqueduct, Old, and its Development. Paper before New England Water Works Association. By Albert L. Sawyer. 10 pp., Journal of Association, December. $1.

Subway for Water. By E. H. Abbott. Illustrated, 18 pp., Outlook, February. 10 cts.

Water Pipe, Cement Lined. Extent of use, methods of construction, advantages and disadvantages. 3 1-2 pp., Municipal Journal and Engineer, Jan. 6. 10 cts.

Wrought-Iron, Cement-Lined, Water Pipe. From paper before New England Water Works Association. By Leonard Metcalf. Illustrated, 7 pp., Engineering News, Jan. 7; 3 1-2 pp., Engineering-Contracting, Jan. 6. 10 cts.

Detecting Leaks in Water Mains. Investigations in Buffalo, N. Y., and Hartford, Conn. 1-2 p., Municipal Journal and Engineer, Jan. 27. 10 cts.

Pumping Machinery, Cleveland's. Illustrated, 2 1-2 pp., Fire and Water, Jan. 13. 10 cts.

Economy of Cincinnati's New Pumps. Figures from report of G. H. Benzenberg. 1-4 p., Municipal Journal and Engineer, Jan. 6. 10 cts.

Pumps at the Manchester Electrical Exhibition. Illustrated, 4 pp., Water, December.

Engineering, Recent Progress in Water. Address before students of Institution of Civil Engineers. 1 p., Water, December. 20 cts.

Meters, Accuracy of. By G. Lidy.

Illustrated. 4 pp., Technique Sanitaire, Dec. 15.

Financing Meter Costs in Columbia, S. C. 1-4 p., Municipal Journal and Engineer, Jan. 27. 10 cts.

Finances, Water Works. Comment on a recent report of the Finance Commission of Boston, Mass. 1-2 p., Municipal Journal and Engineer, Jan, 20. 10 cts.

Water Works Finances. Discussion of bookkeeping of Woonsocket water works according to new and old plans. By G. M. Rex. 1 2-3 pp., Municipal Journal and Engineer, Jan. 6. 10 cts.

Water Works Valuation and Fair Rates in the Light of the Maine Supreme Court Decisions in the Waterville and Brunswick Cases. Paper before American Society of Civil Engineers. By Leonard Metcalf. 4 1-2 pp., Engineering Record, December 23; 10 cts. 6 1-2 pp. Engineering-Contracting, Jan. 13; 10 cts.

Rates, Dispute Water. By Alton D. Adams. 1-2 p., Fire and Water, Jan. 13. 10 cts.

Uniform Features of Water Rates for Cities and Towns of Iowa. By F. H. Munger. 6 pp., Midland Municipalities, January. 10 cts.

Management, Critical Analysis of Water Works. 1 p., Engineering Record, Jan. 16. 10 cts.

Bulletin of the Hoquiam Water Company. Issued for information of consumers. Paper before New England Water Works Association. By Harry C. Heermans. 3 pp., Journal of Association, December. $1.

STREET LIGHTING AND ELECTRIC POWER

Street Lighting from Interurban Railway Circuits. By G. N. Chamberlain. 4 1-2 pp., General Electric Review, February. 20 cts.

Notes on American and European Street Lighting. By H. Thurston Owens. Illustrated. 1 1-2 pp., Engineering News, Jan. 7. 15 cts.

Comparison of Present Day Methods of Street Illumination. By N. R. Birge. Illustrated, 8 pp., General Electric Review, January. 20 cts.

Center Lights for Wide Streets. Suggestions of Walter C. Allen for lighting the streets of Washington, D. C. 1-2 p., Municipal Journal and Engineer, Jan. 13. 10 cts.

Cost of Street Lighting. Reports from a number of California cities before League of California Municipalities. 9 pp., Pacific Municipalities, December. 10 cts.

Spectacular Lighting at the Dedication of the Hartford Bridge. Illustrated, 4 pp., Illuminating Engineer, December. 20 cts.

Entrance Lamps in New York City. By H. Thurston Owens. Illustrated. 1 1-2 pp., Progressive Age, Jan. 1. 10 cts.

High-Efficiency Lamps, Competition from. Paper before National Commerical Gas Association. By T. J. Little. 3 pp., American Gas Light Journal, Jan. 25. 10 cts.

Tungsten Street Fixtures. By C. O. Baker. Illustrated, 2 1-2 pp., Illuminating Engineer, December. 20 cts.

Large Wire Lamps vs. Arcs. Discussion of comparative cost of installation and maintenance. By Alton D. Adams. 1 p., Municipal Journal and Engineer, Jan. 6. 10 cts.

Cableway Tunnel at Gloucester, Mass., Method of Constructing the Subaqueous Pipe and Electric. By H. W. Spooner. Paper before New England Water Works Association. Illustrated, 5 pp., Engineering-Contracting, Jan. 20. 10 cts.

Lighting Circuits, Conditions Affecting Stability in Electric. By Elihu Thomson. Abstract of paper before American Institute of Electrical Engineers. Illustrated, 3 1-2 pp., Electrical Review, Jan. 23. 10 cts.

Cost of Generating Light, Actual. 1 1-2 pp., Electrical Review, Jan. 23. 10 cts.

The Actual Cost of Power. 1-2 p., Power, Jan. 26. 5 cts.

Water Powers. Their use and control. By Donald Cameron Shafter. Illustrated, 6 pp., Review of Reviews, January. 25 cts.

Administration's Position Regarding Water Power Development. Message to Congress by President Roosevelt. 1 2-3 pp., Engineering Record, Jan. 23. 10 cts.

Adjustment of Diversion Damages by Storage Compensation. Paper before New England Water Works Association. By R. E. Horton. 1 1-2 pp., Water and Gas Review, January. 20 cts.

Gas for Lighting European Streets. Paper before Illuminating Engineering Society. By E. N. Wrightington. 1 p., Municipal Journal and Engineer, Jan. 20. 10 cts.

Progress of Gas Industry. Paper before Illuminating Engineering Society. By A. Cressy Morrison. 1 1-2 pp., American Gas Light Journal, Jan. 4. 10 cts.

Per Capita Sales of Gas. By W. D. Marks. 2 pp., Progressive Age., Jan. 1. 10 cts.

Gas Poisoning in Washington. Consideration of the poisonous nature of water gas. 1-4 p., Municipal Journal and Engineer, Jan. 27. 10 cts.

High-Pressure Gas Distribution. Paper before American Gas Institpte. By Jacob D. von Maur. 15 pp., Progressive Age, Jan. 1. 10 cts.

Pipe Standards, Report of Committee of American Gas Institute. Illustrated, 2 pp., American Gas Light Journal, Jan. 11; 4 pp., Jan. 25. 10 cts.

Acetylene Town Lighting. Advantages and review of its use in American cities. 1-2 p., Municipal Journal and Engineer, Jan. 13. 10 cts.

Acetylene Town Lighting. Paper before International Acetylene Association. By W. T. Stinson. 2 pp., Acetylene Journal, January. 5 cts.

FIRE AND POLICE

Fire Protection. Paper before Union of Manitoba Municipalities. By E. G. Wiswell. 1 p., Western Municipal News, January. 10 cts.

Insurance Rates, Private Fire Protection and. Paper before New England Water Works Association. By Gorham Dana. 20 pp., Journal of Association, December. $1.

New York's High-Pressure Service Pays. Observations on results at recent fires. 1-4 p., Municipal Journal and Engineer, Jan. 13. 10 cts.

Pressure at Pawtucket and Central Falls. 1 1-3 pp., Fire and Water, Dec. 30. 10 cts.

Water Works, Fire Protection and. Paper before New England Water Works Association. By Gorham Dana. 5 pp., Insurance Engineering, December. 25 cts.

Fire Boats, Modern. Description of the electrically propelled and controlled fire boats of the city of Chicago. Illustrated, 4 pp., Electrical Review, Jan. 2. 10 cts.

Fire Station, Suburban, at Weston, Mass. Illustrated, 1-2 p., Fire and Water, Jan. 13. 10 cts.

New Fire Service at Gallipolis, O. Illustrated, 3-4 p., Fire and Water, Jan. 13. 10 cts.

Fire, Wharf, at Portland, Me. Illustrated, 1 p., Fire and Water, Dec. 30. 10 cts.

Co-operation Among Small Cities in Fighting Fires. Answer to series of questions addressed to a number of cities. 62 pp., Insurance Engineering, Jan. 27. 25 cts.

Conservation of Cities. Address on fire waste by a special committee of the National Board of Fire Underwriters at the Joint Conservation Conference. 11 pp., Insurance Engineering, December. 25 cts.

Schoolhouses and their Construction. Paper before Ohio Fire Chief's Association. By W. H. Soller. 1 p., Fireman's Herald, Jan. 2. 5 cts.

Police Policy, Golden Rule. Account of methods employed by Chief Kohler in Cleveland, O. 1 1-3 pp., Municipal Journal and Engineer, Jan. 6. 10 cts.

GOVERNMENT AND FINANCE

Commission Plan, Cedar Rapids Under the. Paper before League of American Municipalities. By Charles D. Huston. 3 1-2 pp., Municipal Engineering, January. 25 cts.

Mayors, Non-Residents for. Suggestion of President Roosevelt for the Government of the District of Columbia. 1-4 p., Municipal Journal and Engineer, Jan. 13. 10 cts.

Board of Visitors for City Government. 3 pp., City Affairs, December. 10 cts.

Municipal Needs. Paper before Union of Manitoba Municipalities. By G. R. Coldwell. 2 pp., Canadian Municipal Journal, January. 10 cts.

Legislature, Recommendations of Governors Regarding Public Utility. 2 pp., Electric Railway Journal, Jan. 16. 10 cts.

Recommendations of Governors to the Legislatures. 1 1-2 pp., Electric Railway Journal, Jan. 23. 10 cts.

General Revision of the Municipal Acts. Paper before Union of Manitoba Municipalities. By E. M. Wood. 2 pp., Canadian Municipal Journal, January, 10 cts.

State Commissions and Municipal Departments. By C. J. Crawford. 2 pp., Municipal Engineering, December. 25 cts.

New York Public Service Commission's Report to Legislature. 4 1-2 pp., Electric Railway Journal, Jan. 23. 10 cts.

Report of New York State Public Service Commission for First District of New York. 2 pp., Engineering News, Jan. 21. 15 cts.

Work of the Joint Engineering Staff of the Wisconsin Tax and Railroad Commission. Paper before Western Society of Engineers. By Wm. D. Pence. 2 1-2 pp., Engineering Record, Jan. 2; 3 pp., Jan. 9; 2 pp., Jan. 16. 10 cts. each. 3 1-2 pp., Electric Railway Journal, Jan. 2. 10 cts.

Engineer and Public Service Commissions. 1 p., Engineering Record, Jan. 2. 10 cts.

Wisconsin Public Utilities Law. By B. H. Meyer. 2 pp., Electric Railway Journal, Jan. 16. 10 cts.

Franchises, Municipal. Paper before American Society of Municipal Improvements. By C. C. Brown. 1 p., Municipal Engineering, Jan. 25 cts.

Rate-Fixing Powers of Municipalities. Abstract of decisions of U. S. Supreme Court in New York Gas and

Knoxville Water-rate cases. 2 pp., Municipal Journal and Engineer, Jan. 20. 10 cts.

Cities' Right to Fix Rates. Comment on two recent decisions of the U. S. Supreme Court. 1-4 p., Municipal Journal and Engineer, Jan. 13. 10 cts.

Two Important Supreme Court Decisions on Rate Regulations. 3-4 p., Engineering News, Jan. 21. 15 cts.

Taxation, Local, and Municipal Accounts. By John Allcock. 1-3 p., Local Government Journal, Jan. 16. 10 cts.

Accounting in Iowa, Uniform Municipal. By A. D. Sheets. 2 1-2 pp., Midland Municipalities, January. 10 cts.

Uniform Municipal Accounts. Provisions of an ordinance adopted in Lowell, Mass. 1-2 p., Municipal Journal and Engineer, Jan. 6. 10 cts.

Bad Debts, Cities. Comment on the problem of uncollected city taxes. 1-4 p., Municipal Journal and Engineer, Jan. 20. 10 cts.

TRAFFIC AND TRANSPORTATION

Subway, Chicago Freight. Illustrated. 1 p.. Construction News, Jan. 23. 15 cts.

Some Details of Form Construction for the Philadelphia Subway. 1 p., Engineering-Contracting, Dec. 30. 10 cts.

Reinforced Concrete in Market Street Subway, Philadelphia. By S. M. Swaab. Illustrated, 9 pp., Cement Age, January. 15 cts.

Waterproofing Detroit River Tunnel. By R. G. Wright. 1 1-2 pp., Waterproofing and Fireproofing, January. 15 cts.

Proposed Passenger Subway at Blackfriars, London. Illustrated, 2 pp., Contract Journal, Jan. 6. 20 cts.

Railway Terminals in Cities, Demand for Electric Operation of Steam. 1 p., Engineering News, Jan. 14. 15 cts.

Track Construction in 1908, New Electric Railway. 2 pp., Electric Railway Journal, Jan. 2. 10 cts.

Smoke Nuisance, Railroads and the. By Clinton Rogers Woodruff. 12 pp., Popular Science Monthly, February.

MISCELLANEOUS

Bridges, Concrete Steel Arch. Illustrated, 1 p., Good Roads, January. 10 cts.

Three Reinforced Concrete Bridges in Massachusetts. Illustrated, 3 pp., Cement Age, January. 15 cts.

Rocky River Concrete Bridge near Cleveland, O. 2 1-3 pp., Engineering Record, Jan. 23. 15 cts. Illustrated, 1 1-2 pp., Good Roads, January. 10 cts.

Cost of Concrete Bridges. Paper before National Association of Cement Users. By H. M. Quimby. 1 p., Engineering Record, Jan. 23. 10 cts.

Design of Centering for Concrete Arch for Walnut Lane Bridge. Illustrated. 3 1-2 pp., Engineering-Contracting, Jan. 6. 10 cts.

Connecticut Avenue Bridge, Washington, D. C. Illustrated, 3 pp., Good Roads, January. 10 cts.

Big Creek Bridge, Cleveland, O. Illustrated, 1 p., Good Roads, January. 10 cts.

Removal of Madison Avenue Drawbridge, New York City. By Geo. H. Hefele. Illustrated, 2 pp., Engineering News, Dec. 31. 15 cts.

Surface Drainage of Permanent Bridges. By D. B. Luten. Illustrated, 3 pp., Good Roads, January. 10 cts.

Retaining Wall, St. George Reinforced Concrete. Account of some unusual retaining walls under construction in Staten Island in connection with the removal of grade crossings. Abstract of paper before the Municipal Engineers of New York City. By Louis L. Tribus. Illustrated, 4 1-2 pp., Municipal Journal and Engineer, Jan. 13. 10 cts.

The Stability of Walls. By Henry Adams. Illustrated, 5 1-2 pp., The Surveyor, Jan. 15. 20 cts.

Piers, New, for Transatlantic Steamships, Chelsea Improvements, New York City. Illustrated, 5 pp., Engineering News, Jan. 14. 15 cts.

Weymouth (England) Pier Pavilion. Illustrated, 1 p., Municipal Journal, Dec. 25. 15 cts.

Harbor at Cleveland, O., Recent Improvements to the. Illustrated, 1 1-3 pp., Engineering Record, Jan. 13. 10 cts.

Improvements of Manitowoc Harbor, Wisconsin. Illustrated, 2 pp., Engineering Record, Jan. 23. 10 cts.

Public Buildings. Worthing (England) Public Library, Museum and Art Gallery. Illustrated, 1 p., Surveyor, Dec. 25. 20 cts.

Housing, Town Planning and. By Barry Parker and Raymond Unwin. 9 pp., Journal of Preventive Medicine, January. 60 cts.

Copartnership in Housing in Its Health Relationship. By Henry Vivian. 15 pp., Journal of Preventive Medicine, January. 60 cts.

Slum as a National Asset, The. Contrasting New York and German tenement houses, to the shame of the former. By Charles Edward Russell. Illustrated. 11 pp., Everybody's Magazine, February.

Concrete Work, Construction Details of Reinforced. Paper before Municipal Engineers of the City of New York. By De Forest H. Dixon. 3 pp., Engineering-Contracting, Dec. 23. 10 cts.

Method of Finishing Concrete Surfaces, followed by Acid Wash, with an Estimate of Cost. Illustrated, 2 pp., Engineering-Contracting, Jan. 6. 10 cts.

Bonding New Concrete to Old. Efficiency of Joints. 1 p., Engineering-Contracting, Jan. 20. 10 cts.

Tests of Strengths of Concrete Joints, between old and new work. Paper before Engineers' Society of Western Pennsylvania. Illustrated, 1 2-3 pp., Engineering-Contracting, Jan. 20. 10 cts.

Welding Concrete Reinforcing Rods on the Job. Illustrated, 1 p., Concrete, January. 15 cts.

Testing Concrete in Sea Water. Account of methods to be employed in tests to be made at Navy Yard, Boston. 1-3 p., Municipal Journal and Engineer, Jan. 6. 10 cts.

Cement, Decomposition of, by Sea Water. By A. V. Elsden. 1 p., Water, Dec. 15. 20 cts.

New Viewpoint of the American Portland Cement Industry. By E. C. Eckel. Illustrated, 3 pp., Engineering Record, Jan. 9. 10 cts.

Wheelbarrows, Conmments on Handling Earth with. 1 p., Engineering-Contracting, Dec. 30. 10 cts.

Survey, Topographical, of the City of Baltimore. 1 1-2 pp., Engineering Record, Jan. 2. 10 cts.

Garbage Disposal. Discussion before League of California Municipalities. 14 pp., Pacific Municipalities, December. 10 cts.

Refuse Destruction in Richmond Borough, New York City. Illustrated, 6 pp., Municipal Engineering, December. 25 cts.

Removal of Refuse and Garbage. 1-2 p., Engineering Record, Jan. 16. 10 cts.

Records for Small Cities, Street. Account of the loose-leaf atlas system. 1-2 p., Municipal Journal and Engineer, Jan. 27. 10 cts.

Card Index System. Account of system in use in City Engineer's Office, Easton, Pa. By John McNeal. Illustrated, 2 pp., Municipal Journal and Engineer, Jan. 27. 10 cts.

Cost Keeping on Municipal Contract Work. By DeWitt V. Moore. Illustrated, 5 pp., Municipal Engineering, December. 25 cts.

Specifications for Engineering Works. Paper before Civil and Mechanical Engineers Society. By H. L. Butler. 2 1-2 pp., The Surveyor, Jan. 15. 20 cts. 1 1-2 pp., Contract Journal. Jan. 13. 20 cts.

The Unbalanced Bid. Comment on Chicago street repair contract. 1-3 p., Municipal Journal and Engineer, Jan 27. 10 cts.

Street Signs of Paris. A series of eight pictures of typical signs of the trades of Paris. Illustrated, 5 pp., World Today, January. 15 cts.

License Laws for Engineers and Surveyors. 1 p., Engineering-Contracting, Dec. 23. 10 cts.

National Resources, their Conservation and Utilization. By John Birkinbine. 21 pp., Journal of Franklin Institute, January. 50 cts.

BOOK REVIEWS

Asphalts, Their Sources and Utilizations. By T. Hugh Boorman. New York: William T. Comstock, 1908. Cloth, 7x10 inches, 170 pp. Price, $3.

The author of this work has been continuously engaged in the asphalt trade for thirty-six years, buying and selling material and superintending work. The book is intended as a text-book for architects, engineers and students in the technical schools and municipal offices having charge of road construction. The first part of the work includes material used in a series of articles in a magazine for builders. An introductory chapter describes the discovery and early uses of asphalt. Following are chapters on rock asphalt mastic, Trinidad asphalt, California malthas, Venezuela asphalt, Cuban asphalt, American bituminous limestone, bituminous asphalt sandstone rock, Manjack and Unitaite. These chapters are quite full and interesting and contain information not hitherto collected in any one volume. Late European work is described, rock asphalt work of course, the information being collected on a recent trip. A chapter is given to the use of asphalts in building construction. Perhaps the most valuable part of the work are the chapters on asphaltic oils and their use in road work for dust prevention and to preserve them from the effects of the unusual traffic that has developed in recent years. Methods of waterproofing are described in a separate chapter. The work will no doubt interest those who are engaged in the asphalt trade and contains information of value to engineers. As a text or reference book it is not as well arranged and indexed as it should be.

Elements of Water Bacteriology, with special reference to Sanitary Water Analysis. By S. C. Prescott and C. A. Winslow. New York: John Wiley & Sons, 1908. Cloth, 5 x 7½, 258 pp. Price $1.50.

This is a new revised edition of a text-book published four years ago. Additions have been made to the description of method of isolation of typhoid bacillus and to the bacteriology of sewage effluents.

NEWS OF THE SOCIETIES

New England Water Works Association.—The February meeting will be held at Hotel Brunswick, Copley Square, Boston, Mass., Wednesday, February 10. At 10 o'clock the headquarters in Tremont Temple will be open for the use of members and at 11:30 o'clock a meeting of the executive committee will be held. Lunch will be served at Hotel Brunswick, Copley Square, at 1 o'clock and at 2 o'clock a paper on "Lead Covered Cables a Cause of Electrolysis Upon Water Pipes" will be read by A. A. Knudson, Electrical Engineer, New York City, and one on "Grounding Electric Light Wires on Water Pipes" by Frank E. Merrill, Water Commissioner, Somerville, Mass. A topical discussion will follow. Robert J. Thomas, Lowell, Mass., is president, and Willard Kent, Narragansett Pier, R. I., is secretary of the association.

Museum of Safety and Sanitation.—Frank A. Vanderlip has been chosen treasurer of the Museum, New York City, and an executive office for the administrative and promotive work of the museum has been opened at the United Engineering Societies Building, 29 West Thirty-ninth street. A committee of plan and scope includes Professor F. R. Hutton, chairman; Dr. Thomas Darlington, Commissioner of Health; P. T. Dodge, President of the Engineers' Club; William J. Moran, lawyer, and Henry D. Whitfield, architect. Plans are being pushed to prevent the enormous loss of life and limb to labor through safety devices for dangerous machines and preventable methods of combatting diseases.

South Carolina Good Roads Association.—About one hundred delegates attended the annual meeting at Columbia. The meeting was called to order in the City Council chamber by President F. H. Hyatt. Addresses of welcome were made by Governor Ansl and Mayor Reamer. Commissioner Watson read a paper on "The Relation of Good Roads to Agricultural Development." S. H. Owens, County Supervisor of Richmond, explained the construction of sand clay roads. M. O. Eldridge, of the office of Public Roads, Washington, D. C., delivered a lecture, illustrated with lantern slides, describing the famous roads of the world.

Indiana Gas Association.—The first annual meeting of the association was held at the Claypool Hotel, Indianapolis, Ind., January 20-21. President J. W. Dunbar, New Albany, spoke of the increased consumption of artificial gas following the decrease in the supply of natural gas. He also spoke of legislative regulation of the price of gas. President Ever, of the Indianapolis Gas Company, discussed commercialism in the gas business. Others who made addresses, all of which were of a technical nature, were W. B. McDonald, of Evansville; J. N. Moncrieff, of Bloomington; A. G. Pickens, of South Bend; A. B. Davis, of Indianapolis; J. Earl King, of Chicago, Ill.; F. H. Loomis, Indianapolis; E. A. Wakeman, Terre Haute, and S. C. Rowland, Crawfordsville.

Engineers' Society of Western Pennsylvania.—The following officers have been elected for 1909: President, Geo. T. Barnsley; vice-president, Dr. Walther Riddle; treasurer, E. A. Frost; directors, S. A. Taylor and J. N. Chester.

Illinois Society of Engineers and Surveyors. — The twenty-fourth annual meeting opened at 2 p. m., January 27, in the assembly room of the Great Northern Hotel in Chicago. The program was one of the most complete and comprehensive in the history of the society and the meeting was well attended, there being between 80 and 100 members present. President C. B. Burdick occupied the chair.

Dr. W. A. Evans, Commissioner of Health of Chicago, was introduced and welcomed the engineers on behalf of the city. He followed the welcome by telling something of the work of the Board of Health. When the city had poor drainage, previous to the general raising of the level, the death rate from typhoid was the second largest of any city in the world. Now Chicago is one of the healthiest of the big cities, New York alone having a lower death rate in 1908. In 1901 there were 175 deaths to 100,000 from typhoid, while in 1907 there were only 15 per 100,000 against 12 for New York and an average of 13 for European cities. He stated that if the typhoid rate exceeded 25 the trouble could be looked for in the water supply. If the typhoid cases were confined to one locality, the milk supply should be investigated, while if the sickness was confined to a single family or neighboring families it could be traced to flies and fingers. He cited a case in the Nineteenth Ward where flies were proven to be the cause. In Chicago there are two potential sources of danger which may cause an epidemic at some future time. The lesser of these is the deposit of material, dredged from the rivers, in the lake and the consequent freeing of any vegetable matter present. However, this danger is slight, as 99 per cent. of the dredged material is clay. The other and more serious danger is from sewage pollution. North of Eighty-fifth street no sewers empty into the lake, but above that some do. Also the cities of Michigan City, Whiting and Indiana Harbor empty into the lake and this sewage is liable to be carried to the Chicago cribs. Dr. Evans told of some of the results of the investigation by a general commission appointed to examine Lake Michigan as a source of water supply. It is found that there is no fixedness of direction in the currents of Lake Michigan and that they are dependent on the direction of the wind; that five miles of flow in Lake Michigan did not serve to purify sewage when present in quantity, and that in some cases it could be traced for seven miles. A tug took daily samples of water from the lake over the course from the Chicago crib to Indiana Harbor. All water in that district was contaminated at all times. In a west wind the sewage of the city of Whiting was carried across its own water intake crib and analyses showed 80 per cent. as much bacteria present at the crib as at the mouth of the sewer. The commission had studied only the existing conditions, said Dr. Evans, but at some future time they would suggest a remedy. J. A. Moore responded to Dr. Evans on behalf of the society.

President Burdick chose as the subject of his address "Government Control of Public Utilities." He brought out clearly the close relations that must exist between the utility owner and the public and how each was dependent on the other and should work together.

H. L. Kellogg gave a brief paper on the sewerage system of Clearing, Ill. Clearing is just outside of the city of Chicago, where is located one of the biggest freight yards in the world. It is here that all interchange of cars is made between a large number of the railroads entering Chicago. It is also destined to be the site of a large manufacturing community. The combined system of sewerage is used and the trunk sewers are concrete. The 66-inch sewers have 10-inch walls and the smaller ones 9-inch, no reinforcements being used.

Ernest McCullough, Chief Engineer of the Northwestern Expanded Metal Company, gave a very complete article on "Reinforced Concrete Pipes and Sewers." He discussed sewers, built in place and built in short length on the bank; the latter method offered a better chance for inspection. He also dwelt at some length on the pressure due to the column of earth on the pipe. His conclusions were that for deep sewers only a part of the earth pressure was transferred to the pipe. The paper brought out considerable discussion from various points of view. The desirability in most cases of having the sewers assist in the ground drainage was made clear by City Engineers Clark G. Anderson, of Moline, and W. B. Thistlewood, of Cairo. The discussion of the earth pressure brought out many examples of cases where the earth had disappeared over the top of sewers, in some cases so that a man could stand upright, and the arching action was shown to carry the upper earth.

The report of the Committee on Sewers, of which W. B. Thistlewood was chairman, is given in full on page 176. The secretary read the papers of C. C. Stowell on "A Reinforced Concrete Pressure Tank," and of C. S. Keating, on "The Flood Protection Works at Grand Rapids."

At the session Wednesday evening the paper on "Testing Water Main Extensions" was read by the secretary in the absence of the author, J. J. Smith, City Engineer of Grand Forks, S. D. C. F. Fauntz, City Engineer of Bloomington, presented a paper on a high pressure fire protection pipe line proposed for that city. Some questions were asked as to the details, and favorable comment was made as to the plan outlined. E. Bartow, of the University of Illinois, delivered a very interesting paper on the "Hardness of Municipal Water Supply in the State of Illinois." He gave the results of the various analyses made and also the materials necessary to do the softening. On the conclusion of this paper J. N. Clark and Thomas S. McClanahan were elected honorary members of the society.

The Thursday morning session opened with a report of the committee on water works, which gave operating results of a large number of pumping plants in the State. J. A. Moore, of the Board of Local Improvements of Chicago, gave a paper on "Recent Paving Practice in Chicago," which was followed by one by G. C. Fairclo, City Engineer of Champaign, on "Brick Paving Along Street Railway Tracks." The use of brick laid parallel with the track and joints filled with tar was said to reduce the noise of the cars. The use of concrete slabs under rails and ties was also explained.

A. N. Johnson, State Highway Engineer, chairman of the committee on roads and pavements, gave its report with accompanying tables. Discussion on paving matters brought out considerable of interest on the subject of expansion joints. Every speaker suggested the need of this, as shown by

his own experience. Walter Buehler, Consulting Engineer of the Kettle River Quarries Company, gave a very interesting talk on "The Treatment of Wood Blocks." He told of the large amount of experimenting that has been done and he is convinced of the possibility of manufacturing a satisfactory wood block. Wood blocks should be laid closely, but not wedged, and when so laid and the joints properly filled, if the blocks have been properly treated there will be no tendency to buckle. In the discussion it was also brought out that in some cases No. 2 brick had been substituted in paving when No. 1 was called for. Attention was called to the necessity of providing in the specifications so that the city could go back of the contractor to the manufacturer to be sure of the quality of brick it is getting.

Thursday afternoon was devoted to visiting various points about the city interesting to the engineers. These included the City Asphalt Laboratory, City Pumping Station, the plant of the Northwestern Expanded Metal Company, the Drainage Canal Power Plant at Lockport and the Electrical Show.

After the reading of the papers and their discussion on Thursday evening, the election of officers for the ensuing year was held. The following were elected: John B. Hittell, Chicago, president; John W. Woermann, vice-president; E. Bartow, University of Illinois, and A. N. Johnson, State Highway Commissioner, board of trustees.

Springfield, Cairo and the University of Illinois were all proposed as places for the next annual meeting, Cairo finally being selected.

New Jersey Association of County Engineers.—Practical methods relating to the latest ideas in public highway improvement were studied by the members of the New Jersey Association of County Engineers in connection with the annual meeting of the association in Camden, January 28. They were taken in automobiles to view the Blackwood and Eavesham roads. The former is a macadam road constructed with a heavy asphalt oil as a special binder. The Eavesham road is constructed of "Amiesite," a special road material. After lunch at the Robeson Hotel, the association met in the Camden County Court House. John J. Albertson, engineer of Camden County, presided. The secretary is State Road Supervisor Robert A. Meeker, of the State Road Department. State Road Commissioner Gilkyson spoke on "Future Purposes of the State in Advancing Road Improvements." Papers were read as follows: County Engineer Frank J. Eppele, of Mercer, "Asphaltic Binder"; County Engineer James Owen, of Essex, "Plastic Roads"; County Engineer John J. Albertson, of Camden, "The Virtue of Amiesite"; William E. King, Landing, N. J., "Road Repairs With or Without Elastic Binder."

West Virginia Good Roads Association.—The annual meeting of the Association convened at the Auditorium of the Y. M. C. A. Building, Wheeling, W. Va., Jan. 27. Many matters of importance were discussed. The question of road improvement in West Virginia is rapidly gaining ground. The subject for discussion in the evening was a "Stereopticon Lecture" by Commissioner Earle, of Michigan, illustrating the roads of that State and also an illustrated lecture given by Commissioner MacDonald, of Connecticut, on Technical Road Construction.

National Association of Cement Users.—Among the exhibitors at the fifth annual convention held at Cleveland, O., January 11-16, were the following firms, which handle appliances used in municipal work:

Blaw Collapsible Steel Centering Co., Westinghouse Building, Pittsburg, Pa.—Centering for sewers consisting of a steel shell suitably braced and adjusted by a system of rods and turnbuckles.

Miracle Pressed Stone Co., Minneapolis, Minn.—Hand-tamping moulds for making cement sewer pipe, a continuous and concrete mixer consisting of a double spiral operated in a suitable trough.

Illinois Gravel Co., Princeton, Ill.—Adjustable steel forms for concrete culverts and bridges consisting of sheets of steel connected by channel and tee-irons by means of 5-16-inch stove bolts.

R. Z. Snell Manufacturing Co., South Bend, Ind.—An open steel drum mixer, consisting of a cylinder to which is added a cone. The interior of the drum is smooth except for five small blades.

Cement & Tile Machinery Co., Waterloo, Ia.—The Schenk cement drain tile machine. The tile is made in a jacket or mould that sets on a table that revolves automatically every time a tile is made.

Hull-Holmes Manufacturing Co., Jackson, Mich.—The gravel concrete mixer, a pug-mill by the mixer with measuring devices.

Ransome Concrete Machinery Co., Dunellen, N. J.—Batch mixer.

F. G. Gauntt Manufacturing Co., Fort Wayne, Ind.—Concrete mixer consisting of feed hopper, automatic proportioning feed rooms and a mixing cylinder.

Zeiser Bros., Berwick, Pa.—The Zeiser tie and dividing plates for use in constructing cement sidewalks.

Chain Belt Co., Milwaukee, Wis.—Concrete mixer consisting of a cast-iron drum with curved blades inside.

Koehring Machine Co., Milwaukee, Wis.—A batch mixer with loading and measuring device.

T. L. Smith Co., Milwaukee, Wis.—Side loading rotary batch mixer.

Chicago Concrete Machinery Co., 20 South Canal street, Chicago—A Concrete mixer equipped with a turbine charging elevator.

American Steel and Wire Co., Chicago, Ill.—Triangle mesh concrete reinforcement, suitable for use in constructing concrete sewers.

Municipal Engineering & Contracting Co., 90 West street, New York.—The Chicago improved cube mixer, a continuous batch mixer with loading and measuring device.

Ballou Manufacturing Co., Belding, Mich.—The Little Giant concrete mixer, self-contained portable power apparatus with mixing cylinder and feed hopper.

Ashland Steel Range & Manufacturing Co., Ashland, O.—The U. S. Standard continuous concrete mixer, portable, power supplied by gasoline engine.

Eureka Machine Co., Lansing, Mich.—The Eureka clutch pulley mixer, continuous, with cement and stone bins, driven by belt from independent source of power.

Chicago Electrical Show.—The Electrical Show held in Chicago, Ill., January 18-30, drew large crowds of interested spectators. The Coliseum was a blaze of light from one end to the other. The ceiling was covered with bunting to represent an evening sky and myriads of small incandescent lights representing stars completed the illusion. The exhibits were arranged in booths separated by aisles. Probably the largest single exhibitor was the Commonwealth Edison Company, which occupied one end of the Coliseum with an exhibit of the uses of electricity in industrial enterprises. This and the U. S. Government and Marconi installations of wireless telegraph instruments probably attracted the most attention. There were also numerous exhibits of the new tungsten lamps, the General Electric Company having the most complete layout. Of much interest to superintendents of lighting plants was the exhibit of the Excell Arc-Lamp Company, of New York and Chicago. This company showed the "Excello" flaming arc lamp both with yellow and white lamp. It is claimed for this lamp that it gives more than six times as much light with the same current as the old style arc lamps; that the distribution of light is better, both as to direction and no shadow beneath. It can be operated on either direct or alternating current lines with equal satisfaction. This light is used exclusively in Berlin for street lighting and has recently been recommended for use in London. The lamps are guaranteed for two years. The Allis-Chalmers Co., of Milwaukee, had generators, motors and motor generators on exhibition. Thomas & Smith, 17-19 South Carpenter street, Chicago, exhibited their electrically driven submergible Bilge pump and sewage ejector. These pumps are shipped complete from the factory ready for installation. Their capacity is seventy gallons per minute against a head of two feet. The Northern Electrical Manufacturing Company, of Madison, Wis., showed a number of pieces of their apparatus, including generators, transformers, etc., together with the application of their motors to various kinds of industrial apparatus. One of the most interesting of the latter was an electric rock drill which simplifies the drilling of rock in sewer cuts. The Crocker-Wheeler Company, manufacturers of generators and motors, also had a full line of exhibits.

Municipal Engineers of the City of New York.—The following officers have been elected: President, Robert R. Crowell; first vice-president, A. S. Tuttle; second vice-president, Chandler Withington; secretary, C. D. Pollock; treasurer, H. W. Vogel; directors, G. L. Christian, J. T. Fetherston, G. R. Ferguson, A. D. Flinn, J. H. Weinberger. The membership of the society, which is limited to engineering employees of Greater New York, is 595.

Greater Highways Association of Southeastern Virginia.—The association has called a convention to meet at the Jefferson Hotel in the city of Richmond, on the 10th and 11th of February, 1909. It is hoped to assemble at this convention representative people from all parts of Virginia who are interested in the work of securing better county roads. It is proposed to merge this association into the Greater Highways Association of Virginia, and to carry on during the next twelve months an active campaign in the interest of better highways.

Calendar of Meetings

February 3.
American Society of Civil Engineers.—Regular meeting at Society House, 220 West Fifty-seventh street, New York.—Charles Warren Hunt, Secretary.

February 1-6.
National Brick Manufacturers' Association.—Twenty-third Annual Convention, Rochester, N. Y.—Theo. A. Randall, Secretary, Indianapolis, Ind.

February 9.
Connecticut Society of Civil Engineers.—Annual meeting, Hartford.—J. Frederick Jackson, Secretary, New Haven, Conn.

February 10-11.
Greater Highways Association of Southeastern Virginia.—Convention, Richmond, Va.—Geo. W. Rogers, Assistant Secretary, 301 E. Main street, Richmond, Va.

February 17-18.
New England Gas Association.—Annual meeting, Boston, Mass.—N. W. Gifford, Secretary, East Boston, Mass.

March 2-4.
Northwest Cement Products Association.—Annual convention, Minneapolis, Minn.—J. C. Van Doorn, Secretary Security Bank Building, Minneapolis, Minn.

June 8-12.
American Water Works Association.—Twenty-ninth annual convention, Milwaukee, Wis.—J. M. Diven, Secretary, 14 George St., Charleston, S. C.

July 6—9.
American Society of Civil Engineers.—Annual convention, Mount Washington Hotel, Bretton Woods, N. H.—Charles Warren Hunt, Secretary, 220 West 57th street, New York, N. Y.

November 9-11.
American Society of Municipal Improvements.—Annual convention, Little Rock, Ark.—A. Prescott Folwell, Secretary, 241 W. 39th St., New York, N. Y.

THE WEEK'S CONTRACT NEWS

Relating to Municipal and Public Work—Street Improvements—Paving, Road Making, Cleaning and Sprinkling—Sewerage Water Supply and Public Lighting—Fire Equipment and Supplies—Bridges and Street Railways—Sanitation Garbage and Waste Disposal—Police, Parks and Miscellaneous—Proposals and Awards

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
		STREET IMPROVEMENTS		
Indiana	Bluffton	Feb. 4, 10 a.m.	Bldg. 6 gravel and macadamized roads, 45,447 ft. long; also 5 stone and 1 gravel road, various tps.	O. D. Garrett, County Auditor.
Indiana	Laporte	Feb. 4, 10 a.m.	Two macadamized roads, 2.3075 and 2.8062 miles long	C. H. Miller, County Auditor.
New York	Buffalo	Feb. 4, 11 a.m.	Grading and macadamizing Hamburg pike, 50 ft. wide	F. G. Ward, Com'r of Pub. Wks.
Indiana	Frankfort	Feb. 4, 2 p.m.	Constructing 9 gravel roads for Clinton County	Chas. F. Cromwell, County Auditor.
Indiana	Rockville	Feb. 4, 6:30 p.m.	Constructing 2 gravel roads	H. A. Henderson, County Auditor.
Pennsylvania	Harrisburg	Feb. 4	Bldg. 1,900 ft. brick road and 9,318 ft. macadam, W. Mead twp.	Jos. W. Hunter, State Hwy. Com'r.
Pennsylvania	Wilson	Feb. 4, 7 p.m.	Vit. brick or hillside block paving, sewers, etc., Locust St.	Maneese & Earl, Boro. Engrs.
Illinois	Downers Grove	Feb. 4, 7:30 p.m.	Brick paving, 45,595 sq. yds.; earth excavation 27,011 cu. yds. for roadways and 2,552 cu. yds. for park ways; 116 storm-water inlets and 66 manhole covers, adjusted to grade	J. S. Lozier, Village Engineer.
Missouri	St. Louis	Feb. 5	Paving various streets and alleys; est. cost, $122,285	W. B. Dryden, Sec'y Bd. Pub. Impts.
Indiana	Tipton	Feb. 5, 10 a.m.	Constructing 3 gravel roads	J. F. Barlow, County Auditor.
Ohio	Cleveland	Feb. 5, noon	Brick and Medina stone paving, grading, curbing, sundry sts.	W. J. Springborn, Pres.Bd.Pub.Serv.
Indiana	Anderson	Feb. 5, 2 p.m.	Bldg. gravel road on line between Henry and Madison Cos.	W. T. Richards, County Auditor.
Indiana	Lebanon	Feb. 5, 2 p.m.	Bldg. gravel road 9,160 ft. long on Boone & Clinton Co. line	B. F. Herdrick, County Auditor.
Ohio	Cincinnati	Feb. 5, noon	Improving Kilby road, White Water, also road Anderson twp.	Fred. Dreihs, Clk. Co. Comrs.
Pennsylvania	Pittsburg	Feb. 5, 10 a.m.	Street asphalt paving, grading, curbing, 2 sts.	A. B. Shepherd, Dept. Pub. Wks.
Indiana	Terre Haute	Feb. 6, 11 a.m.	Constructing 4 roads	N. G. Wallace, County Auditor.
Indiana	New Albany	Feb. 6	Brick or granitoid paving, Locust St.; estimate, $5,723	Board of Public Works.
Iowa	Indianola	Feb. 8, 7 p.m.	Paving 15,390 sq. yds. 3-in. creo. wood block on 5-in. concrete, 7,884 lin. ft. 6 x 20-in. concrete curb, 450 yds. extra excav.	Arthur Lee, City Clerk.
New York	New York	Feb. 8, 2 p.m.	Maintaining asphalt pavement, repairing sidewalks	John F. Ahearn, Pres. Manh.Boro.
Indiana	Franklin	Feb. 8, 1:30 p.m.	Constructing 7,093 ft. gravel road in Union township	W. B. Jennings, County Auditor.
New Jersey	Atlantic City	Feb. 8	Macadam paving, 6-in. 7,203 sq. yds.; 12-in. telford, 4,407 sq. yds.; vit. clay block, 9,922 sq. yds. curb, etc	E. D. Rightmire, City Engineer.
Michigan	Kalamazoo	Feb. 8, 5 p.m.	Paving Vine, Church, Burdick, Porter and Spring Sts., and Douglas and Stuart Aves., with brick, asphalt or other material	City Clerk Ross.
California	Pasadena	Feb. 9	Paving Dayton St. with broken stone base, rock screenings and liquid asphaltum wearing surface, 7-in. deep	Heman Dyer, City Clerk.
Ohio	Elmore	Feb. 9, 10 a.m.	Constructing Kreodone floor for bridge	H. Papenbach, Co. Auditor.
Ohio	Toledo	Feb. 9, 10 a.m.	Repairing Jerusalem road	D. T. Davies, Co. Auditor.
Ohio	Toledo	Feb. 9, noon	Paving Collingwood Ave. with ashpalt; 2 aves. any mat.	Reynold Voit, Sec'y Bd. Pub. Serv.
Louisiana	New Orleans	Feb. 9, noon	Bldg. Schillinger pavement, one mile both sides of Main St.	Dreux Angers, Clk. Bd. Aldermen.
New York	New York	Feb. 9, noon	Furn. 12,000 tons 1 1-2 and 3-4 in. broken stone and screenings; also 8,000 tons, 2,500 tons and 12,500 tons, various districts.	Geo. Cromwell, Pres. Boro. Richm'd.
Wisconsin	Fond du Lac	Feb. 10	Cement paving 55,000 yds., 3 streets; asphalt, 8,000 yds., one st.	E. W. Clark, Mayor.
Texas	Brady	Feb. 10, 3 p.m.	Grading streets; city has all necessary machinery	A. R. Crawford, City Secretary.
Indiana	Lafayette	Feb. 12, 10 a.m.	Constructing 2 gravel roads, Wabash and Shelby twps	J. P. Foresman, County Auditor.
Indiana	Fowler	Feb. 12, noon	Constructing 30,200 feet of gravel road	Lemuel Shipman, County Auditor.
Ohio	Barnesville	Feb. 12, noon	Delivering and breaking 340 rods of limestone on turnpike	B. F. Mackall, Clk. Turnpike Co.
Georgia	Savannah	Feb. 15, noon	Furn. city with 5,000 sq. yds. granite paving block, f. o. b. Sav.	Harry Willink, Dir. Pub. Wks.
Illinois	Paris	Feb. 15	Brick paving 21,000 sq. yds.; Wm. Blackman, Eng'r	Walter Logan, Clk. Bd. Local Impts.
Minnesota	St. Paul	Feb. 15, 10 a.m.	Improving Bald Eagle Lake Ave.; macadamizing or gravel.	Edw. G. Krahmer, County Auditor.
Ohio	Norwood	Feb. 15, noon	Macadamizing and constructing curb and gutters	H. D. Armstrong, Clerk.
Ohio	N. Baltimore	Feb. 15, noon	Quarrying, crushing and delivering stone	Wm. P. Henning, Clerk.
Arizona	Whipple Barracks	Feb. 15, 3:30 p.m.	Constructing concrete walks	K. P. Williams, Q.M.
Ohio	Milford	Feb. 16, noon	Repairing turnpike with No. 2 broken stone in 2 Counties	James Sheehy, Village Clerk.
Ohio	St. Bernard	Feb. 17, noon	Macadamizing concrete curb and gutter, etc., Murray road	George Schroeder, Village Clerk.
Ohio	Cleveland	Feb. 17	Grading, draining and improving State Aid Road No 6.	A. B. Lea, County Surveyor.
South Carolina	Greenwood	Feb. 18, noon	Brick, wood block, bitulithic or granite paving, 21,333 sq. yds., grading, curbing, draining, Public Square	Kenneth Baker, Mayor.
Indiana	Spencer	Feb. 18, noon	Constructing 1 1-2 miles macadam road bet. Clay and Owen Cos.	Geo. W. Edwards, County Auditor.
Indiana	Greenfield	Feb. 18, 2 p.m.	Constructing 3,960 ft. macadam road; est. $2,970	C. H. Troy, County Auditor.
Ohio	Oakwood	Feb. 18, noon	Brick paving, Oakwood Avenue	H. E. Parrott, Village Clerk.
Pennsylvania	Wilkes-Barre	Feb. 18, 2 p.m.	Furn. two 8-ton road rollers and 2 road sprinkling carts, also stone crusher, cap. 12 to 18 tons per hour, 15 h.-p. engine; bins 10-ton cap.; chutes, screens, and elevator	James N. Norris, County Auditor
Ohio	Cincinnati	Feb. 19	Improving Walton Creek road in Columbia twp	Fred. Dreihs, Clk. Co. Com'rs.
Arkansas	Lake Village	Feb. 20	Constructing 13,000 sq. ft. concrete sidewalks	Hermon Carlton, Sec'y Bd. of Impts.
Ohio	Newton	Feb. 27, noon	Grading and constructing curb and gutters	Village Clerk.
North Carolina	Mooresville	Mar. 1	Constructing 4 miles of macadam road	N. B. Mills, Chm. Co. Com.
Indiana	Bloomfield	Mar. 2, 2 p.m.	Bldg. 2 gravel and macadamized roads, Wright and Stockton tps	Peter M. Cook, County Auditor.
		WATER SUPPLY		
Missouri	Kansas City	Feb. 4	Bldg. revetment work and pile dike for protec. of water inlet.	S. J. Armstrong, Sec'y Water Com'rs.
North Dakota	Minot	Feb. 4	Bldg. concrete and brick pumping station, complete with pumps, filters, etc.; steel tower & tank; 11 miles 6 to 16-in. mains.	E. S. Severance, City Engineer.
Florida	Key West	Feb. 5, 11 a.m.	Furn. condenser filter, feed water heater, etc.; also remodeling pumping and distilling plant at barracks	Capt. C. H. Lanza, Q. M.
Alabama	Ft. Morgan	Feb. 5, 1:30 p.m.	Razing and reerecting Cypress tank	Wm. M. Colvin, Q. M.
Ohio	Lorain	Feb. 6, noon	Furn. and del. deep well pump of 10,000 gals. per hour	Board of Public Service.
Pennsylvania	Avonmore	Feb. 6, 7 p.m.	Bldg. complete w.w. plant for boro.; Robt. H. Wilson, C. E.	Prof. W. E. Smeltzer.
South Dakota	Edgemont	Feb. 8, 8 p.m.	Labor and material for constructing water works	C. A. Hardy, City Auditor.
Pennsylvania	Beaver	Feb. 9, 8 p.m.	Bldg. add'n to pump. station and install. 1,000,000-gal. triplex pump	G. R. Bovaid, Boro. Sec'y.
Arizona	Phoenix	Feb. 10, 4 p.m.	Pumping engine, 3,000,000 gal. cap.; cost, $20,000	Robt. A. Craig, Supt.Water Works.
Missouri	Kansas City	Feb. 11, 2 p.m.	Furn. and del. f.o.b. open cars K. C., all pipe during 1909, inc. 837 tons 36-in. and 1,454 tons 30-in. Class D pipe; also Class C of 1,593 tons 24-in.; 170, 20-in.; 2,840 16-in.; 1,311 12-in.; 15 of 10-in.; 150 8-in.; 100 6-in.; total, 8,470 tons	S. J. Armstrong, Sec'y Water Board.
Mississippi	Itta Bena	Feb. 15, 2 p.m.	Bldg. complete water works and sewer system	Xavier A. Kramer, C. E., Magnolia.
Minnesota	New Ulm	Feb. 15, 5 p.m.	Bldg. covered rein. concrete reservoir, 1,000,000 gals. capacity.	H. F. Blomquist, City Engineer.
Kentucky	Sebree	Feb. 15, noon	Constructing complete system of water works for town	C. H. Ramsey, Mayor.
Pennsylvania	Oil City	Feb. 18, 7 p.m.	Sale of Snow duplex, comp. con. engine, steam jacketed 20-in. and 40-in. steam cylinders, 17-in water cylinder, 24-in. stroke, Ind. air pump and condenser	A. M. Breckenridge, Clk. Water Bd.
Illinois	Decatur	Feb. 19, 2 p.m.	Furn. masonry, concrete, steel work and piping for pump. sta.	Albert Leach, City Clerk.
New York	Webster	Feb. 20, noon	Bldg. w. w. system, inc. 6 miles c. i. pipe, pumping station, small reservoir, standpipe, power pumps, etc.	Knight & Hopkins, Rome, Engrs.
Manitoba	Winnipeg	Feb. 22, 11 a.m.	Furn. and erecting turbine pump with elec. motor for w. w.	H. N. Ruttan, City Engineer.
Michigan	Owosso	Feb. 24, 10 a.m.	Bldg. complete pneumatic pumping plant	D. M. Christian, Pres. Bd. Pub. Wks.
Kansas	Wichita	Mar. 15, 7:30 p.m.	Constructing system of water works; est. cost, $860,000; cert. check, $10,000; plans, $25; Hiram Phillips, St. L., Mo., Engr.	R. N. Dorr, City Clerk.
		SEWERAGE		
Alabama	Birmingham	Feb. 3, noon	Bldg. storm sewer mains and branches, cost $175,000	Maury Nicholson, City Engineer
Minnesota	St. Paul	Feb. 4, 2 p.m.	Constructing a sewer on Bates Ave.	Mr. Grode, Pres. Bd. Pub. Wks.
Florida	Miami	Feb. 4, 7:30 p.m.	Constructing sewer.	A. H. Adams, City Clerk.

BIDS ASKED FOR

State	City	Received Until	Nature of Work	Address Inquiries to
Pennsylvania...	Wilson.....	Feb. 4, 7 p.m.....	Bldg. tile sewer, etc., and paving Locust St.....	Oliver Stokes, Boro. Clerk.
Kentucky.....	Louisville.....	Feb. 5, noon.....	Contracts 21 and 22, Walnut St. sewer; 23, Clay St.; 24, St. Xavier St.; inc. 5,460 ft. concrete and pipe sewer, 18 to 30-in., inc. 315 cu. yds. concrete; dep. sewer, 6 to 10 ft.; cost $75,000.	P. L. Atherton, Chm. Sewer Comn.
Alberta.....	Banff.....	Feb. 5, noon.....	Furn. 28 ft. 8-in.; 1,810 ft. 9-in.; 600 ft. 15-in. pipe; 30 6-in. off 15-in. and 60 6-in. off 9-in. sewer junctions; del. f. o. b. cars...	Howard Douglas, Comr. of Parks.
Pennsylvania...	Pittsburg.....	Feb. 5, 10 a.m.....	Furn. castings for manholes and catch basins, bldg. 24-in., 9-in. and two 15-in. pipe sewers, paving, etc.....	A. B. Shepherd, Dept. Pub. Wks.
Ohio.....	Portsmouth.....	Feb. 6, noon.....	Constructing sanitary sewer in alley.....	G. H. Schneider, Pres. B. P. S.
Ohio.....	College Hill.....	Feb. 8, noon.....	Bldg. 6 to 12-in. vit. pipe sewers in 6 sts.; J. A. Stewart, Engr...	F. R. Strong, Village Clerk.
Alabama.....	Graymont.....	Feb. 9.....	Constructing 9,000 feet sanitary sewer.....	W. A. Lester, Mayor.
New York.....	Niagara Falls....	Feb. 9, 7:30 p.m....	Bldg. 3,300 ft. extension to tunnel trunk sewer, cost, $70,500....	W. D. Robbins, City Engineer.
New York.....	Brooklyn.....	Feb. 10, 11 a.m.....	Constructing sewers in various streets.....	Bird S. Coler, Boro. President.
Minnesota.....	Detroit.....	Feb. 10, 7 p.m.....	Furn. mat. and bldg. sewer system, inc. gen. sewer, dist. sewer in Dists. 1 to 16 inclusive; joint sewer, Dist. 1 to 5 and Dist. 7, and joint sewer, Dists. 8 to 15; 2 sewer lifts, septic tank and storm water sewer; Loweth & Wolff, St. Paul, Engrs.....	Charles G. Sturtevant, City Clerk.
Maryland.....	Baltimore.....	Feb. 10.....	Separating soil and waste lines from storm water system, Custom House.....	James Knox Taylor, Wash., D. C.
Ontario.....	Brantford.....	Feb. 11, noon.....	Furn. and laying 2,250 ft. 12-in. extra strength sewer pipe, 635 ft. 12-in. c. i. pipe, 11 manholes, greatest cut, 32 ft., av., 17 1-2	T. Harry Jones, City Engineer.
Missouri.....	St. Joseph.....	Feb. 12.....	Constructing several sewers.....	David Lawlor, City. Engr.
Georgia.....	Atlanta.....	Feb. 15.....	Bldg. sewers for 1908; furn. cement, sewer pipe and new castings	R. M. Clayton, City Engineer.
Mississippi.....	Itta Bena.....	Feb. 15, 2 p.m.....	Constructing complete sewer system and water works.....	Xavier A. Kramer, C. E., Magnolia.
California.....	Santa Cruz.....	Feb. 15, 9 a.m.....	Constructing sewer system, including 3 septic tanks, 62,912 ft. 6-in.; 4,343 ft. 8-in.; 2,290 ft. 10-in.; 16,834 ft. 12-in. pipe.	J. L. Wright, City Clerk.
Montana.....	Great Falls.....	Feb. 15.....	Constructing sewer in Dist. No. 15.....	C. W. Swearingen, City Engr.
Ohio.....	Ashtabula.....	Feb. 16, noon.....	Bldg. 1,372 ft. 22 x 33-in. and 3,020 ft. 20x30-in. concrete sewer; 774 ft. 20-in., 2,154 ft. 15-in., 1,790 ft. 10-in. sewer, etc.....	A. J. Richardson, Clk. Bd. Pub. Serv.
Illinois.....	East St. Louis...	Feb. 17, noon.....	Bldg. system of concrete and pipe sewers, 33,500 ft. 3 to 10 1-2 ft. drain; 5 drainage and 2 sewage pumping engines, vertical, single-acting gas engines, dir. con. to hori. cent. pumps.....	W. J. Crocken, City Engineer.
Maryland.....	Baltimore.....	Feb. 17, 11 a.m.....	Bldg. sanitary sewers; contract No. 35, inc. 26,500 ft. 6-in. pipe 32,700 ft. 8-in. pipe and 5,450 ft. 10-in. to 24-in. pipe sewers	Harry W. Rodgers, Sec'y Bd. Awards
Texas.....	Denton.....	Feb. 20, 2 p.m.....	Furn. material and labor or labor alone, for sanitary sewer system, inc. 13,635 ft. 8 to 15-in. and 32,860 ft. 6-in. pipe; 21 manholes, 68 tampholes, also 100,000-gal.-per-day unit of disposal plant, requiring 755 cu. yds. earth excav., 130 cu. yds. concrete, 4,000 lbs. rein. steel, 500 cu. yds. screened gravel or broken rock and auto. appar. for filling and emptying 3 beds	N. Werenskiold, C. E., Dallas.
Ohio.....	Newtown.....	Feb. 27, noon.....	Bldg. drain from South Side Main St. to Clear Creek.....	Edgar W. Griffith, Village Clerk.
New York.....	Newburgh.....	Mar. 2.....	Constructing sewer in Robinson Ave., with laterals.....	City Clerk.
Iowa.....	Grundy Center..	Mar. 8.....	Constructing 8 and 10-in. sanitary sewer; cost, $15,000 to $18,000	E. A. Cary, Chm. Sewer Com.
			BRIDGES	
South Carolina .	Spartanburg.....	Feb. 4.....	Bldg. Bright's bridge over South Tyger River.....	D. M. Miles, County Supervisor.
Ohio.....	Cincinnati.....	Feb. 5, noon.....	Bldg. concrete bridge over Muddy Creek, in Miami township....	Stanley Struble, Pres. Co. Com'rs.
Indiana.....	Richmond.....	Feb. 6, 2 p.m.....	Repairing the Commons bridge in Centre township.....	D. S. Coe, County Auditor.
Arkansas.....	Mena.....	Feb. 6.....	Bldg. 3 Co. bridges over 3 rivers; appropriation, $19,000.....	Wright Prickett, County Judge.
Texas.....	Cuero.....	Feb. 6.....	Bldg. bridge over Guadalupe River, near Hochheim.....	Rudolph Kleberg, Jr. County Judge.
Oklahoma.....	Lawton.....	Feb. 9.....	Bldg. 75-ft., also 32-ft. span steel bridge with stringers.....	W. E. McGurren, Chm. Co. Com'rs.
Iowa.....	Fort Des Moines.	Feb. 10, 3 p.m.....	Bldg. steel highway bridge at target range.....	Constructing Quartermaster.
North Dakota..	Grand Forks.....	Feb. 12, 10 a.m.....	Bldg. all-steel and wooden bridges ordered by County in 1909...	Hans Anderson, County Auditor.
Ohio.....	Lisbon.....	Feb. 15.....	Bldg. abutments, also iron skew bridge, 50 x 20 ft.....	County Auditor.
Ohio.....	Norwalk.....	Feb. 15, 11 a.m.....	Bldg. sandstone abutment, steel joists, Kreodone block floor.....	County Auditor.
Virginia.....	Lynchburg.....	Feb. 15, 2:30 p.m....	Bldg. vein concrete viaduct, inc 1,600 cu. yds. excavation. 220 tons steel bars, 3,700 cu. yds. steel, 1,040 sq. yds. brick...	H. L. Shaner, Chief Engineer.
Minnesota.....	Waseca.....	Feb. 16.....	Constructing several bridges.....	County Auditor.
Ohio.....	Cleveland.....	Feb. 20 11 a.m.....	Bridge work, per report No. 2,189; 2 culverts, Newburg twp....	A. B. Lea, County Surveyor.
Montana.....	Powderville.....	Mar. 1.....	Constructing bridge over Powder River for County.....	County Clerk, Miles City.
Ohio.....	Cleveland.....	Mar. 3, 11 a.m.....	Constructing bridge approach.....	A. B. Lea, County Surveyor.
Arkansas.....	Paris.....	Mar. 4.....	Constructing 6 bridges for County.....	Fred. N. Cater, County Clerk.
Louisiana.....	Harrisonburg....	Apr. 5, noon.....	Bldg. steel bridge at Bushley Bayou; also repairing one.....	H. W. Bethard, Clk. Police Jury.
			LIGHTING AND ELECTRICITY	
New York.....	New York.....	Feb. 3, 2 p.m.....	Completing electric wiring system at City Hall.....	John F. Ahearn, Pres. Boro. Man.
Ohio.....	Cleveland.....	Feb. 5, noon.....	Furnishing 8,000 16-in. and 2,000 14-in. boulevard glass globes and 140,000 gas mantles.....	E. H. McIntosh, Sec'y Bd. Pub. Serv.
Missouri.....	St. Louis.....	Feb. 5, noon.....	Lighting with mantle lamps, certain sts., etc.; also furnishing electricity for lighting bldgs. and lighting sts., etc., both for 10 years; 21,929 mantles, $700,000; 1,196 arcs, $130,000; 1,003 incandescents for bldgs., $30,000.....	A. J. O'Reilly, Pres. Bd. Pub. Imp.
Saskatchewan..	Saskatoon.....	Feb. 5, 5 p.m.....	Supply of 500 h.p. boilers in two or three units for city.....	E. L. White, Electrical Supt.
Ohio.....	Col'bus Barracks.	Feb. 8, 10 a.m.....	Furn and install. transformer, etc., underground, etc., con., etc.	Capt. H. J. Hirsch, Q. M., U.S. Army.
Lousiana.....	Houma.....	Feb. 9, noon.....	Bldg. municipal electric lighting plant, inc. boilers, engines, 60 k.w. generator, arc and 50 c.p.lights for entire town.....	Calvin Wurzlow, Mayor.
Texas.....	Terrell.....	Feb. 10.....	Erecting electric light plant; frame bldgs, 48x92 ft.; cost, $2,000; steam and electric machinery, $15,000.....	E. R. Miller, City Clerk.
New York.....	Brooklyn.....	Feb. 10, 11 a.m.....	Alterations, etc., light and power equipment Dis. Train School..	Bird S. Coler, Boro. President.
Florida.....	White Springs...	Feb. 10.....	Bldg. $3,000,000 power plant for Suwanee Riv. RR. & Pow. Co.	D. G. Ziegler & Co., Jacksonville, Fla.
Virginia.....	Nat'l Solders' H.	Feb. 10, 1:30 p.m....	Power house and equipment, tunnels, etc., for Soldiers' Home...	John T. Hume, Treas. of Home.
Kentucky.....	Richmond.....	Feb. 17.....	Light and heat plant and dis. system, Univ. Hall and bldgs.....	Bd. Regents, E. State, Normal Sch.
Illinois.....	Chicago.....	Feb. 17.....	Bldg. municipal electric light plant in ten mos.; cost, $151,250..	John J. Hanberg, Com'r Pub. Wks.
Wisconsin.....	Milwaukee.....	Feb. 17, 10:30 a.m...	Furn. and erecting complete gas producer and gas engine electric lighting plant in bldg. furnished; $22,500 check.....	C. J. Poetsch, Pres. Bd. Pub. Wks.
Alberta.....	Calgary.....	Feb. 18, noon.....	Three water tube boilers of 1,000 h.p., with piping and induced draft system of 2,500 h.p.; 500 k.w. generator con. to 750 h.p. high-speed engine for ry. system, cond. switchbd., etc. ..	H. E. Gillis, City Clerk.
Alberta.....	Lethbridge.....	Mar. 1.....	Bldg. mun. power plant, inc. boilers, etc., economizer, feed pumps, mechanical draft pipe work and valves, steam turbine generator; reerecting engines; condensing sets, crane, switchboards, etc.; motor generators and transformers; bldg. steel work, etc.; Smith, Kerry & Chace, Toronto, Engrs.....	Geo. W. Robinson, Sec'y-Treas.
Dist. of Col'bia.	Washington.....	Mar. 22.....	Furnishing electrical supplies, etc., for Bur. Eng. & Printing....	Joseph E. Ralph, Dir. B. E. & P.
			MISCELLANEOUS	
New York.....	New York.....	Feb. 4.....	Furn. and delivering lumber for parks in Manhattan.....	Henry Smith, Pres. Park Board.
New York.....	New York.....	Feb. 4.....	Furnishing lumber for Williamsburg bridge.....	J. W. Stevenson, Bridge Com'r.
Illinois.....	Aledo.....	Feb. 4, 10 a.m.....	Erecting fireproof jail and sheriff's residence for County.....	Whitsett & Drury, Moline, Archs.
Pennsylvania...	Wilkes-Barre....	Feb. 5, noon.....	Furnishing two police alarm signal boxes of best type.....	Fred H. Gates, City Clerk.
Indiana.....	Gary.....	Feb. 5, 3 p.m.....	Bldg. 2-story and base. bldg. for fire, police, etc.; 8 cells, etc....	C. O. Holmes, Town Clerk.
Ohio.....	Canton.....	Feb. 6, noon.....	Bldg. 17 enclosed fire escapes for various school bldgs.....	W. C. Lane, Clk. Bd. Education.
New York.....	New York.....	Feb. 8, 2 p.m.....	Fencing vacant lots in Manhattan.....	John F. Ahearn, Boro. Pres.
Georgia.....	Fitzgerald.....	Feb. 11.....	Bldg. jail; J. R. McEachron, Peachtree St., Atlanta, Arch.....	Board of Com'rs, Ben Hill Co.
Tennessee.....	Madisonville....	Feb. 11, noon.....	Erecting jail bldg. for Monroe County.....	Bldg. Com., care of County Clerk.
Michigan.....	Frankfort.....	Feb. 16, 3 p.m.....	Repairing south pier at Frankfort.....	Col. M. B. Adams, U. S. A., Gd. R'ds.
Ohio.....	Youngstown.....	Feb. 16, 11 a.m.....	Bldg. $50,000 Co. jail; Owsley, Boneherle & Co., Archts.....	W. H. Ruhlman, Chm. Co. Comrs.
South Dakota..	Redfield.....	Feb. 17, noon.....	Erecting jail building; C. E. Eastman, Des Moines, Ia., Arch....	Auditor of Spink County.
Iowa.....	Newton.....	Feb. 18, 2 p.m.....	Bldg. Co. Court House; Proudfoot & Bird, Des Moines, Archts..	Frank Sellman, County Auditor.
Pennsylvania...	Wilkes-Barre....	Feb. 23, 2 p.m.....	Furn. 4 or 7-passenger touring automobile, complete.....	James N. Norris, County Controller.
California.....	San Francisco...	Feb. 25, 9:15 a.m....	Furn. mat. and bldg. pier No. 34, inc. piles, cement, reinforcing material, castings, steel I-beams, plates, angles, bolts, rivets, spikes, steel rails, crushed rock, etc.....	W. B. Thorpe, Sec'y Harbor Com.
Nebraska.....	Omaha.....	March 1, noon.....	Bldg. Court House for Douglas Co.; John Latinser, Archt.....	D. M. Haverly, County Clerk.
Illinois.....	Chicago.....	Sept. 15.....	Furn. voting machines up to $100,000 value.....	Election Commissioners.

STREET IMPROVEMENTS

Huntsville, Ala.—Council has passed an ordinance providing for the paving of Franklin street; material will be mineral rubber asphalt.

Tuscaloosa, Ala.—As a result of a conference between a Committee from the Board of Public Works of Tuscaloosa County and the Board of Revenue of Jefferson County, a magnificent boulevard may be opened up between Birmingham and Tuscaloosa.

Bisbee, Ariz.—Work will start at once on the improvement of streets and roadways, according to plans adopted by Council.

Bisbee, Ariz.—Bids will be advertised for cement for construction work; 7,000 to 12,000 barrels of standard hydraulic cement will be required.—Geo. Gage, City Clerk.

Los Angeles, Cal.—Bids will be received about April 1 for the construction of about 70,000 square yards pavement; road will be tamped, with 3 inches of rock and top coat of screenings.—A. B. Waddingham, Engineer, 310 Tajo Building, Los Angeles; S. J. Lord, City Clerk.

Pasadena, Cal.—Council has received resolutions ordering oil macadam paving on Dayton street; oiling of San Pasqual street; improvements on Stevenson avenue; resolution of intentions to open and extend Walnut street from Lake avenue to Hill street.

San Bernardino, Cal.—As soon as the improvement of C street is finished Base Line will be improved.

San Bernardino, Cal.—Council has adopted plans for macadamizing C street from Third to Ninth streets; plans are also being considered for a sewer on Sixth street west from I.

San Bernardino, Cal.—Bids for the furnishing of a 10-ton gasoline motor road roller; rotary street sweeper, 9 feet long, 30 inches diameter, with hickory broom and material for two renewals; standard tamping roller; 25-horsepower standard horizontal tubular boiler, complete, on skids and two wooden tank oil wagons, equipped with competent oil spreading devices, were not opened on January 13; bids will be readvertised, as it is desired to call for bids on articles not mentioned in the original advertisement.—Harry Allison, City Clerk.

San Jose, Cal.—Council has rejected all bids for a road scarifier; Clerk has been instructed to readvertise for bids.

San Jose, Cal.—Council is considering the improving of Whitney street and curbing on Fox avenue and Market, Third and San Antonio streets.

San Mateo, Cal.—Council has instructed Davenport Bromfield, City Engineer, to prepare specifications and preliminary estimates of the cost of constructing a number of asphalt and asphaltic concrete streets; estimated cost, $500,000.

Hartford, Conn.—The Street Board has decided to widen Broad street from Park River to Capitol avenue from 50 to 70 feet.

Waterbury, Conn.—Permanent improvement of Union Square in front of the new St. Mary's Hospital is assured by the vote of the Board of Commissioners of Public Works, ordering City Engineer R. A. Cairns to secure an estimate of expense; unofficial estimate placed the expense at from $3,000 to $5,000; also an estimate for a permanent pavement on Exchange place and a new road at West Branch.

Jacksonville, Fla.—County Commissioners will greatly improve the public highways of the County; seven cars of Carolina gravel and a seven-ton road roller have been ordered.

Jacksonville, Fla.—The Board of Public Works has rejected all bids for work on Enterprise street; work will be done under supervision of the County Engineer.

Palatka, Fla.—Council has passed ordinances for the paving with Georgia cement dock or Augusta gravel the following streets: River, Third, Fifth, Laurel, Kirby and Reid. Kirby street from Oceola street to connect with the new county road will be graded twenty feet and paved twelve with Interlachen gravel; amount of money to be expended upon present budget of paving is $6,000; granolithic sidewalk has been ordered constructed on Reid street from Eleventh to Twelfth street, and Eleventh from Reid to Main.

Macon, Ga.—Bibb County is considering an expenditure of $10,000 for construction of a driveway forty miles in length and almost completing the encircling of the city.—A. T. Long, County Commissioner.

Rome, Ga.—Rome Railway and Light Company is considering a $250,000 bond issue, $27,000 for paying part of street paving expenses and remainder for enlarging and improving power plant.

Downers Grove, Ill.—The village officials recently passed an ordinance to pave certain streets with Mineral Rubber Paving; village also contemplates doing considerable paving with brick during the coming year.

Ottawa, Ill.—The Board of Local Improvements is considering the improvement of certain parts of Clinton, Superior, Washington, Lafayette, Jackson and Jefferson streets; total estimated cost, $34,562.15.—W. H. Irwin, Engineer Board of Local Improvements.

Elkhart, Ind.—The Board of Public Works has adopted a resolution ordering the widening of Edwardsburg avenue from the Big Four crossing to the city limits, or Bristol street, a distance of about half a mile.—City Engineer Smith.

Fort Wayne, Ind.—The Board of Public Works has ordered plans for repaving Columbia and paving Calhoun streets; also for new walks the entire length of Calhoun street and Chestnut street.

Hammond, Ind.—City Engineer J. Lyons has prepared plans for 3,300 square feet of macadam pavement on East Goslin street.

Indianapolis, Ind.—The Board of Public Works will soon ask for bids for the following street improvements: Grading and graveling Grace street and Oakland avenue, Dearborn street, grading and paving sidewalks of Twentieth street; also grading and paving roadway of Jefferson avenue, Owosso avenue, Georgia street, Lowell avenue, and Thirty-seventh street, and sidewalks in Alabama, Roosevelt, Ethel, Holton, Twenty-ninth, Chester and Oxford streets.—J. T. Elliott, Chairman Board.

Indianapolis, Ind.—The Board of Public Works has confirmed the following improvement resolutions: Senate and Brookside avenues, curbing; Dearborn street, gravel roadway, and Twentieth street, cement walks.—B. H. Miller, Engineer.

South Bend, Ind.—The Board of Public Works has received a petition asking that the Prarie street brick pavement be extended to the present city limits instead of to the old limits, as specified.

Terre Haute, Ind.—City is considering the paving of Hulman, S. 3d and N. 24th streets with brick.—E. Schmidt, City Engineer.

Davenport, Ia.—Council has called for bids for paving Second, Dixwell, Seventh, Eleventh, Twelfth, Harris, Cedar and Tenth streets, and Lincoln avenue; City Engineer Murray has been ordered to prepare plans on Fillmore, Gaines, Sixth, Eleventh and Ninth streets; Council has also ordered the improvement of Hickory Grove and Brady street roads.

Coffeyville, Kan.—Council has granted petitions for sidewalks on Fifth and Sixth streets.

Houma, La.—City has invited bids for constructing concrete sidewalks on Main street, comprising about 1½ miles.

Baltimore, Md.—Bids will be received by the Department of Public Parks and Squares February 3 for furnishing buff color brick or asphalt tile and block for projected improvements for park system; approximately 400,000 brick or asphalt tile and block or equivalent area will be purchased.—J. Barry Mahool, President Board of Awards.

Baltimore, Md.—City Engineer Fendell has slated the following streets for improvement: Fulton avenue, Payson street, Columbia avenue, Lanvale street, Wilson street, Clement street, Fremont avenue, Eager street, Oliver street, William street, Ostend street, Valley street, Park avenue, Aisquith street and Fairmount avenue; the Highways Commission has decided to pave First avenue with Belgian blocks upon a concrete base.

Baltimore, Md.—The Board of Awards has rejected all bids for repairing sheet asphalt streets; City Engineer Fendell will draft new specifications in which will be stated the approximate quantities of the material to be used.

Elkton, Md.—The Commissioners for Cecil County have decided to build four sections of permanent road the coming spring and summer; proposals will shortly be received for the work; roads will be built under State aid and will be from Chesapeake City to St. Augustine; from Cecilton to the Delaware State line; from Pleasant Hill to Blue Ball, and from Farmington to Greenhurst.

Mattapoisett, Mass.—Town will vote on large appropriation for the repair of the general roads of the town and the macadamizing of streets.

Coldwater, Mich.—City will extend the pavement on Chicago street for a distance of half a mile; cost, $19,000.

Detroit, Mich.—The Conners Bros. Company of Lowell, Mass., will sub-let the laying of about one million brick; all material will be furnished.

Detroit, Mich.—The Street Opening Committee has decided to open Clayton avenue from Martin to Clippert streets.

Detroit, Mich.—The Board of County Road Commissioners will receive bids early in February for the purchase of two steam rollers to be used in road construction.

Detroit, Mich.—Council has directed the Department of Public Works to advertise for proposals for paving Sheridan avenue with cedar blocks, on concrete foundation, with Medina, Berea or other suitable curbing; estimated cost, $22,837.—Jacob J. Haarer, Commissioner.

St. Paul, Minn.—As cement and brick crosswalks may be substituted to an extent for wood crosswalks, the Assembly has deferred award of a $34,000 lumber contract.

Marshall, Mo.—City is considering an issue of bonds to macadamize streets.

Carson City, Nev.—Citizens are talking of calling a special election to bond the city for $100,000 to repair the roads; road between Carson City and Lake Tahoe has been destroyed in a number of places, and as the traffic over that road means much to Carson the people are very anxious that it be repaired at once.

Collingwood, N. J.—Borough Council has decided to call a bond election in a short time to provide funds for much-needed street improvements.

Millville, N. J.—A society known as the Carmel Farmers' Association has been organized at that little village, five miles northwest of this city, and has started a movement to have the old Bridgeton and Millville turnpike put into proper repair.

New Brunswick, N. J.—Morgan F. Larson, County Engineer, has prepared plans for the construction of ten county roads.

Clarendon, N. Y.—The State Board of Supervisors has decided that the proposed State road will also pass through the towns of Clarendon, Barre and Shelby.

Newburgh, N. Y.—Plans are being advanced by Council for the permanent improvement of South Water street from the proposed new West Shore Station to Renwick street.

New York, N. Y.—Chief Engineer Briggs, of the Borough of the Bronx, has estimated the cost of improving the various streets as follows: East 178th street with asphalt block, cost $14,100; Jennings street, $25,000; East 212th street, regulating and grading, $5,000; West 235th street, $43,500; Odell avenue, $12,950; Knox place, $4,600; Kingsbridge Road, $8,000; Rochambeau, $37,000; Seddon avenue, $8,070; the local Board is considering the paving of Beck street with sheet asphalt, paving East 178th street with block asphalt and opening West 245th street.

Niagara Falls, N. Y.—At the meeting of the Board of Public Works, Commissioner Tracerse called attention to the wretched condition of the sidewalks in certain sections of the city; Superintendent Hulls told the Board that he is already at work preparing a statement of defective sidewalks and he will be prepared to submit the list to the Board at its next meeting.

Port Jervis, N. Y.—Council is considering the laying of pavement on Jersey avenue, Pike and Fowler streets.

Rochester, N. Y.—Council is considering the improvement of Goodman street by cement walks and sewer; total cost, $3,000.—Wm. Ward, City Clerk.

Rochester, N. Y.—The Men's Civic Club is discussing the paving of Carter street, the opening up of Lux street and Folsom place from Carter street through to Portland avenue, the installing of water and sewer systems in each, and the improvement of Durnan street.—B. A. Winthrop, Secretary.

Troy, N. Y.—Council is considering an ordinance for the paving of North Adams street, from Eighth to Tenth street with granite blocks laid upon a sand foundation; it is intended to use the granite blocks removed from River street.

Cincinnati, O.—City Engineer Sundmaker has estimated for the improvement of a portion of Freeman avenue $12,203.

Cincinnati, O.—Council is considering a motion directing the Chief Engineer to prepare and submit to Council a resolution declaring it necessary to improve Meir avenue, from Observatory avenue to Griest avenue, with brick; ordinances have been passed as follows: To proceed with the improvement of Denham street, from Linden street to Western avenue; to proceed with the improvement of Salem street, from Menlo avenue to Stettinus avenue.

Columbus, O.—The estimate for the improvement of Ohio avenue from Main street to Livingston avenue, has been completed by Engineer Maetzel; total cost will be more than $25,000; work will be started just as soon as the weather will permit.

Dayton, O.—Council is considering a plan to have Norwood avenue opened and extended from Mound to Williams streets, so that a direct opening from Fifth street to National avenue and the Soldiers' Home can be provided.

Norwalk, O.—Council has received resolutions for the curbing, draining, grading and paving of Seminary and Summit streets.

Portsmouth, O.—Proposals will be received Feb. 16 for the purchase of $42,500 4 per cent. street improvement bonds.—Filmore Musser, City Auditor.

Toledo, O.—The plan to pave Orange street between Huron and Superior has

been indorsed by the Council Committee on Public Improvements; job will cost about $4,500, of which about two-thirds will be paid by the city at large.

Youngstown, O.—Council is considering a plan to make a through street from Rayea avenue to Front street, crossing the Erie tracks with a bridge from Wood street.

Youngstown, O.—The Board of Public Service will recommend that Mahoning avenue be paved from the end of the viaduct to the city limits.

Lawton, Okla.—Five thousand dollars will be expended in the construction of a model road, probably macadam, across Cache Creek, extending from the Rock Island Railroad at the southeast corner of Lawton to the foothills on the opposite side of the creek; this is the project inaugurated by the Lawton Good Roads Association; accepting the proffered services of a special engineer sent out by the Government, the Good Roads Association of this city has determined to have constructed more than a mile of road, extending over one of the worst pieces of thoroughfare in the County.

Wagoner, Okla.—Contracts will probably be let early in the spring for street paving in sundry streets.—A. F. Evans, City Clerk.

Harrisburg, Pa.—Governor Stuart has strongly recommended the bill now in the Legislature for a State road; proposition, which will have the backing of the administration, is to build a road from Allegheny through Westmoreland, Somerset, Bedford, Fulton, Franklin and Cumberland to Harrisburg; from Harrisburg two plans present themselves, which are almost equally advantageous; one is to continue the road to Philadelphia through Lancaster, Chester and Delaware; other is to build this stretch through Lebanon, Berks and Montgomery.

Meadville, Pa.—Crawford County has advertised bids for the construction of a little more than a two-mile stretch in West Mead township, of which 1,900 feet will be of brick and 9,318 feet of macadam.

Spartanburg, S. C.—Residents of Pine street are distinctly desirous that work be begun improving this thoroughfare at the earliest possible time, a drawing having been already submitted to the members of the City Council by a competent civil engineer engaged to do the work, and every item necessary to the construction of good paving being shown on this profile.

Aberdeen, S. D.—Council will be asked to pave Main street from the Milwaukee crossing to the corporate limits on the north.

Johnson City, Tenn.—Washington County will vote on $150,000 bond issue for the improvement of public roads.

Knoxville, Tenn.—City is considering the immediate paving of five additional miles of street.

Brady, Tex.—The work of grading the streets of Brady will be let by contract, this being the decision of the City Council; it was at first intended by members of the Council to handle the work themselves; they will have $18,000 to invest, having spent $2,000 for the machinery, which is now on hand, ready for the work.

Dallas, Tex.—City Engineer J. M. Preston has reported that the paving on Elm street is in a very dangerous condition; Commissioners have adopted a resolution for the repairing of Crowders street with Jacksboro rock; cost, $300; also ordered the City Secretary to advertise for bids for furnishing white rock to be used as a sub-base for the Jacksboro rock to be put on Garrett avenue.

Honey Grove, Tex.—Citizens will vote February 24 on $7,000 bond issue for street improvements.—The Mayor.

Temple, Tex.—Citizens will vote March 1 on $50,000 bonds for paving of street and alley intersections and abutting municipal property.

Ashland, Va.—W. S. Brown has introduced a resolution in the Town Council providing for the construction of concrete sidewalks along the streets of the town provided the property owners will pay 50 cents per square yard as their part of the cost of the paving abutting their property.

Boydton, Va.—Chase City has voted to issue $60,000 bonds for road improvements; Lucius Gregory, Supervisor, will be in charge of this work; citizens of Clarksville County have voted $59,000; R. T. Gordon, Supervisor, will have charge.

Norfolk, Va.—Assistant Street Inspector Grinalds has been authorized by the Board of Control to remove all defective sidewalks in the Eighth Ward and to replace them with cinder walkways.

Norfolk, Va.—The Board of Aldermen is considering the paving of King street with vitrified brick.

Norfolk, Va.—The Board of Control has appropriated $2,100 for the completion of curbing and paving along Raleigh avenue.

Portsmouth, Va.—The Board of Supervisors has received a petition that a public road be opened from Glascow street to the old Key road.

Portsmouth, Va.—The Street Committee has reported favorably on paving King street with brick, at a cost of $2,000; Committee is considering application for pavement on London street.

Richmond, Va.—Henrico County has defeated proposition to issue $300,000 bonds for the improvement of roads.

Aberdeen, Wash.—Heron street will be paved with vitrified brick.

Olympia, Wash.—An effort to complete the State road from Tacoma to the Government road leading on to Mt. Tacoma, before the thousands of exposition visitors arrive in the West, will be made by State Highway Commissioner J. N. Snow, who stated at the joint meeting of the Committee on Good Roads and Bridges that an appropriation of $25,000 will be asked for the purpose.

Seattle, Wash.—Council has ordered the following work: Paving West Blaine street, grading First avenue Northeast, grading Second avenue Northeast, paving Twenty-third avenue North, paving Second avenue West, paving Garfield place, paving Howe street, grading Canfield place, grading North Sixty-seventh street, grading First avenue Northwest, grading Eighteenth avenue South, grading Pacific place.

Seattle, Wash.—Under the provisions of a resolution adopted by Council the grading and regrading of Dearborn street and others is provided for along lines somewhat modified from original plans for this improvement, and it is estimated that the improvement will cost in the neighborhood of $300,000.

Tacoma, Wash.—Council has adopted resolutions for the improvement of six streets.

Green Bay, Wis.—City Engineer W. W. Reed has prepared plans for brick paving in sundry streets.

BIDS RECEIVED AND CONTRACTS AWARDED

Huntsville, Ala.—A contract for the paving of West Clifton street with a patent asphalt pavement was awarded by Council to the Mineral Rubber Paving Company; the bid of that corporation was found to be the cheapest of more than a half dozen that were submitted a week previous; the ordinance providing for an issue of $40,000 of bonds to provide money for the West Clinton street work was passed.

Selma, Ala.—The city has awarded contracts for paving as follows: For brick paving on Broad and Water streets, to Crockett Paving Company; asphalt paving on Broad street, to Memphis Asphalt & Paving Company, Memphis, Tenn., at $84,500.—V. B. Atkins, Mayor.

Little Rock, Ark.—E. N. Wiegel, city, has contract for grading West Seventh street.

Oakland, Cal.—Council has awarded contract for improving East Twenty-second street to Ransome-Crummey Co., at the prices named for said work in their proposal on file, namely: Grading street, including sidewalk cutting for filling, two cents per square foot. Macadamizing, averaging from 8 to 6 in. thick, 7 cents per square foot. Curbing with redwood, 12 cents per linear foot. Concrete gutters, 14 cents per square foot.—F. R. Thompson, City Clerk.

Pasadena, Cal.—J. E. Haddock was awarded the contract for work on Harkness avenue, his bid being $2,870.70; sidewalk, 9½ cents; grading, 20 cents; curb, 22 cents; gutter, 14 cents.

San Bernardino, Cal.—Council received bids on crosswalks and the contract was awarded to E. R. Werdin & Co., of Los Angeles, owing to a mistake of the McIntyre Company, whose bid was irregular in that linear feet were designated, whereas the figures were for square feet; the Werdin bid was, per linear foot, $1.15 for concrete, and 72 cents for asphalt-macadam; for drain culverts, $6.75, $6, $5.25, $4.40. Council before awarding the contract decided that asphalt-macadam walks were the kind wanted and so ordered that all other kinds be rejected.

The bids for the muncipal repair plant were not opened as it had been decided to readvertise for bids as it is desired to call for bids on articles not mentioned in the original advertisement.—Harry Allison, City Clerk.

Pensacola, Fla.—City has awarded contract to C. H. Turner Construction Company, city, at $3,425, for building road on Palafox street from DeSoto to Jordan street, to be constructed of Goulding cinders, according to plans and specifications prepared by City Engineer Thornton.

In awarding the contract for the construction of ten miles of concrete sidewalks to Whiddon & Kennedy, of Birmingham, Ala., at 10 cents per square foot, January 18, the Board of Public Works secured a rate for this work which is placed at 40 per cent. less than could be otherwise obtained; this was made possible by the successful bidder's offer to give a discount of 10 per cent. on all work when payment is made in full in cash.

The following bids were submitted: Brewer & Jones, Birmingham, Ala., 19.8 cents per square foot; A. C. Knight, Cartersville, Ga., 11 cents per square foot; W. M. Leftwich Company, Nashville, Tenn., 13.2 cents per square foot; Rush & Weller, Phoenixville, Pa., 11.7 cents per square foot; Whiddon & Kennedy, Birmingham, Ala., 10 cents per square foot; Constantin, Riess & Guerin, New Orleans, La., 15 cents per square foot; F. J. McGuire, Greenville, N. C., 12 cents per square foot; Meacham Contracting Company, Hopkinsville, Ky., 13.4 cents per square foot; Faulkes-Forbes Company, Terre Haute, Indiana, 13½ cents per square foot; Sullivan Cement Stone Company, Sullivan, Ind., 12.3 cents per square foot; Bowe & Page, Augusta, Ga., 9.8 cents per square foot. The bid of Bowe & Page, of Augusta, Ga., was not submitted in proper form and was rejected.

Work will not be commenced on the construction of the walks until after the sewerage system is completed and accepted by the city. Approximately 634,000 square feet of sidewalks will be built. Mr. Whiddon, of the firm of Whiddon & Kennedy, will move from Birmingham to Pensacola. It is stipulated that abutting property owners on any street where pavements are to be placed, and whose property is not among that to be improved, can have sidewalks placed at the same rate by applying to the city. By this means it is believed that a large number of walks will be placed, as many property owners will take advantage of the low price to be paid for modern walks. All work is to be done under the supervision of the City Engineer and according to specifications provided by him.

Naperville, Ill.—The Board of Local Improvements has awarded the contract to Hayes & Sons, of Dunkirk, Ind., at $77,000 for draining, grading, curbing, paving with macadam a system of streets, requiring approximately 13,640 feet of 6 to 18-inch sewer pipe, 160 stormwater inlets, furnished and set; 36 manholes, 56,000 linear feet 5x 20-inch concrete curb and 87,600 square yards of macadam. Bids given last week under "Sewerage."

The details of the successful bid follows: 50,000 feet concrete curb, 23½ cents; 160 inlets, each, $3.50; 23,000 cubic yards grading, 35 cents; 87,600 square yards macadam paving, 52 cents; 1,700 feet 18-inch pipe sewer, 90 cents; 590 feet 15-inch, 80 cents; 2,630 feet 12-inch, 70 cents; 3,320 feet 10-inch, 60 cents; 3,400 feet 8-inch, 55 cents; 2,000 feet 6-inch, 50 cents; 36 new manholes, each, $20; 74 old manholes, adjusted, each, $2; total cost, $76,895.—W. S. Shields, 1201 Hartfrod Bldg., Chicago, Engineer; P. E. Kroehler, President of Board.

Indianapolis, Ind.—The Union Asphalt Company submitted the lowest bid to the Board of Public Works for constructing asphalt roadway and curbing Roanoke street from Michigan to Tenth street, at $3.56 per square yard.—Blaine H. Miller, City Engineer.

Contract for paving Liberty street has been awarded to A. D. Bowen; Missouri street and Washington avenue to J. W. Abbott, and Musingum street to American Construction Company, all of Indianapolis.

La Fayette, Ind.—The County Commissioners of Tippecanoe and Warren Counties, January 15 awarded the contract to Levandowski & Kruse, of Monticello, for constructing the Hilderbrand County line gravel road a little over three miles at $7,549.

Davenport, Ia.—Contracts for paving have been awarded as follows: 3,252 square yards on Sylvan avenue and 900 square yards on Rusholme street to McCarty Improvement Company, city, at $1.73 and $1.85 per square yard, respectively; 5,247 square yards brick on Ripley street, to Independent Construction Company, at $1.68 per square yard, and 1,540 square yards with brick, on Warren street, to the Hydraulic Concrete Construction Company, at $1.64 per square yard.

Jeffersonville, Ky.—Thomas F. O'Neil has been awarded the contract by the city for improving Sixth street with granitoid sidewalks, stone curbing, vitrified brick gutters and street crossing at $7,068.97; W. O. Sweeney bid $7,792.

Lexington, Ky.—The Board of Public Works has let to Buford A. Graves the contract for the construction of concrete sidewalks on the following streets: South side of High street from Upper to Mill, 10 feet wide; west side of Upper street from High street to Maxwell, 6½ feet; north side of East Third from Race to Walton avenue, 4 feet; only the bid of Mr. Graves was received, which was accepted as follows:

cement walk, 13½ cents per square foot; cement curb, 45 cents per running foot; cement curb and gutter combined, 60 cents per running foot.

The Board also signed contract with Hughes-Forman Company for the construction of concrete sidewalks on Upper street on both sides from Sixth to Seventh street.

Denton, Md.—Caroline County has awarded contract to Goslin & Messinger, Federalsburg, for grading and macadamizing about 1¼ miles of road between Federalsburg and Reliance.—I. L. Dukes, Clerk Board of County Commissioners.

Rockville, Md.—The lowest bid received January 12 by the County Commissioners for constructing the Kensington road was submitted by McKay Engineering Company, of Baltimore, for $30,940.

Lynn, Mass.—The Board of Public Works, January 25, awarded the contract for curbing to G. F. Ames & Co., of 390 Broadway, at 70 cents per foot for straight curbing, 75 cents per foot for champfered curbing and 92 cents per foot for circular curbing; for corner stones he is to get $5 and for catchbasin stones $8. He has had the contract for the past two years. His principal contestant was J. C. Linehan, of Peabody, who had the contract some years ago; their prices were practically the same and Ames won because he was a Lynn man and has given satisfaction; the contract calls for 10,000 feet more or less; last year between 6,000 and 7,000 feet were used.

Somerville, N. J.—A good stone road from this place to Flemington, by way of Whitehouse, is now assured, as the Hunterdon Commissioners, January 21, awarded the contract for the extension of the Whitehouse road to Flemington, a distance of 5.8 miles, to Van Keuren & Son, of Newark, at their bid of $39,886.51; the Somerville bidders were Richards & Gaston, $43,948.80; George Fech, $46,578.52; work will begin in the spring.

Buffalo, N. Y.—The contract for paving Kentucky street, 28 feet wide with round edge shale brick on macadam base has been awarded by Council to F. V. E. Bardol & Co., at $6,500.—F. G. Ward, Commissioner of Public Works.

Portsmouth, O.—Samuel L. Rice, city, has been awarded contract for 1,018 square yards Ohio Portsmouth block with tar filler on 6-inch concrete filler, at $1.16, and 528 linear feet cement combination curb and gutter, 37 cents; total, including 40 cubic yards excavation, 38 feet 12-inch sewer pipe, 1 catchbasin, 528 feet 4-inch drain, tile and repairing one manhole, $1,440.87; Kelley Brothers bid $1,564; S. Monroe & Son, $1,496.26; W. H. Hudson, $1,531.24; J. A. Grimes, $1,800.94, all bidders being in city.—Martin W. McMahon, Clerk, Board of Public Service.

Wilkes-Barre, Pa.—Horn & Neff, of Slatington, have been awarded the contract by the Street Highway Commissioner for constructing the new State road from the Borough of Plymouth to Hemlock Township, a distance of 25,534 feet, at $70,786. Birdsboro trap rock is specified for the macadam; work will begin as soon as the weather permits in spring; fifteen months are allowed for the completion of the work.

Chattanooga, Tenn.—The Board of Public Works has awarded the contract for paving Broad street to the West Construction Company, Chamberlain Building, at $48,460, and Hooke street, to the Southern Paving & Construction Company, Chamberlain Building, at $13,160.

Chatham, Va.—The Board of Supervisors of Pittsylvania County January 25 awarded a contract to Haymes & Haymes, local contractors, for four miles of macadam road, at $2,965 per mile, the Board reserving the right to increase the number of miles to six; convict labor will be furnished by the State; the bid was the lowest submitted; the road will be a continuation of the one leading from Danville to Design and will be constructed to Pleasant Gap, about eight miles from Danville.

Norfolk, Va.—The Board of Control, January 25, awarded contracts to the following concerns furnishing the city with various supplies during the remainder of this fiscal year: The Wise Granite Company, Wise, N. C., was given the contract for No. 2 granite paving block at $2.70 per ton, with the further understanding that the city will have the option of accepting all materials failing to measure up to reasonable specifications at a reduction of 33 1-3 per cent. of the contract price.

B. Gray Tunstall, agent for Linehan-Carroll & Company, was awarded the contract for furnishing No. 1 granite block at $3.70 per ton, with the same conditions as named in the agreement with the Wise Company.

The contract for "Dixie" brand, Portland cement lime, was given to Batchelder & Collins, the material to be furnished at $143 per barrel.

S. E. Morris & Co. have been awarded a contract by the Board of Control for furnishing 108 tons of gravel for use on certain streets in Berkley Ward; the price is $1.10 per ton, delivered in Berkley Ward.

Tacoma, Wash.—Some remarkably low bids were received in the proposals for paving the streets in districts No. 412 and 413, the contracts for which were awarded by the Commissioner of Public Works, January 19. D. A. Williams was awarded the contract for laying the pavement on J and other streets in district No. 413. His bid was $107,273. This is $24,850 less than the Engineer's estimate. Other bidders were A. A. Keasel, $114,482; Lister Construction Company, $125,800; Barber Asphalt Paving Company, $109,558; W. J. Murphy, $110,971; Stoll, Sweeney & Holz, $127,673; Joe Wells, $119,421, and the Coast Contracting Company, $120,964.

The Barber Asphalt Paving Company was given the contract for grading I and other streets in district No. 412 at $92,710. This is $21,900 less than the Engineer's estimate. The other bidders were D. A. Williams, $97,710; Lister Construction Company, $109,700; W. J. Murphy, $99,873; Joe Wells, $107,010, and Coast Construction Company, $109,059.

The Coast Construction Company was given the contract for grading in district No. 658 at $4,609. This is $219 under the estimate. There were three other bidders for this work.

Charleston, W. Va.,, Council Jan. 21 let the contract for bitulithic paving to the Atlantic Bitulithic Company on the following streets at the following prices: Virginia, Elizabeth to Duffy, $2.15 per yard; total cost, including curb, $11,951.50. Elizabeth, Kanawha to Washington, $2.15 per yard; total, $8,382.95. Lee, Morris to Elizabeth, $2.12 per yard; total, $29,872.34. Quarrier, end of paving on Elizabeth, $2.15 per yard; total, $15,243.80. Ruffner avenue, Kanawha to Washington, $2.08 per yard; total, $10,089.06. Fayette street, Pennsylvania to Delaware avenue, $2.15 per yard; total, $18,549.45. Delaware avenue, Charleston to Randolph, $2.08 per yard; total, $14,142.74. Pennsylvania avenue, Charleston to Columbia boulevard, $2.12 per yard; total, $19,843.06. Kanawha, Court to Capitol, $2.12 per yard; total, $7,396.48. Summers, Kanawha to Post Office gate, $2.12 per yard; total, $3,894.64. Virginia, Court to McFarland, $2.12 per yard; total, $12,631.78. Total of bitulithic pavement, $151,996.90. The company is to do the work under a 10-year guarantee and to start work in Kanawha street within ten days after signing of the contract. Council also let to Daniel Trapp, of Newport, Ky., the following paving: Virginia, end of paving to K and M, brick, Logan block; price per square yard, $1.36; total cost, including curb, $18,179.30. Truslow street, Logan, $1.35 per yard; total, $5,370.90. Bullitt, end of paving to Spring, $1.34 per yard; total, $2,771.90; Bigley avenue, K and M, to Ash, Logan, $1.45 per yard; total, $11,805.50. Spring, Bullitt to Elk, Logan, $1.41 per yard; total, $1,512.73. Spring, Bigley avenue to Elk, Logan, $1.38 per yard; total, $3,764.74; Slack, Capitol to Spring, Logan, $1.39 per yard; total, $4,811.30. Total to Daniel Trapp, $48,053.45.

Following streets were let to contract to Pfaff & Smith at following prices: Donnally, Court to Capitol, Standard wire cut, $1.26 per yard; total, $5,177.80. Fry, Capitol to Shrewsbury, Kanawha, $1.30 per yard; total, $2,012.80. Donnally, Court to Elk, Standard wire, $1.32 per yard; total, $4,185.54. Broad, Virginia to Kanawha, Kanawha, $1.31 per yard; total, $1,718.37. Summers, Donnally to Dryden, Logan, $1.39 per yard; total, $3,250.41.

The Board also recommended that the following street be let to Marquis & Wallace Company: Laidley, State to Donnally, Standard wire, $1.27 per yard; total, $4,001.25.

SEWERAGE

Corona, Cal.—Engineer H. Clay Kellog, Santa Ana, Cal., is preparing plans for storm and sanitary sewers.

Redlands, Cal.—The City Trustees have ordered that the City Engineer bring in plans and specifications for a storm water drain, to care for the water that comes down Sylveria and Stuart and in the territory thereabouts; it is proposed to carry this water down into the zanja; it is also planned to build a sewer over in the same section, but this has not been brought to a direct issue.

San Francisco, Cal.—A question has arisen in the southern end of the city regarding the disposal of an inflow of sewage from San Mateo county, and it is now considered by members of the improvement clubs as a powerful argument in favor of a Greater San Francisco, or at least the annexation of San Mateo county or part of it to San Francisco; initiative has been taken in this matter by the Ocean View Improvement Club in an objection to the Board of Supervisors against the dumping of sewage from Hillcrest, the Crocker Tract and contiguous territory just outside the county line and in San Mateo county into Wyoming avenue creek.

Bridgeport, Conn.—Rudolph Hering, Sanitary Expert, has recommended the disposal of the city's sewage by dilution with filter beds later on; election will be held next November as to whether the city shall accept the plan; cost, $3,000,000 or more.

Hartford, Conn.—The Board of Public Works has recommended that the Sewer Commissioners submit an order for a sewer in Clark street, together with an estimate of the cost.

Clearwater, Fla.—Holmboe Company, Lincoln Savings Bank Bldg., Louisville, Ky., may let contract about March 15 for installation of sewers and water works; plans will be ready February 15.

Aurora, Ill.—The sewer extensions in the southeastern part of the city which are to be put in this year will cost the taxpayers in the neighborhood of $60,000, according to the figures of City Engineer Tarble; there will be approximately 30,000 feet of sewer extensions, thus putting a price of about $2 a foot on the work.

Mendota, Ill.—City is considering the construction of sewers in Sewer District No. 2.

Ottawa, Ill.—The Board of Local Improvements is considering construction of a sewer in Post street; cost, $1,223.82.—W. H. Irwin, Engineer, Board of Local Improvements.

Hammond, Ind.—Plans have been prepared for extending the sewer on Columbia street to the river; 48 feet of 48-inch and 144 feet of 36-inch iron pipe will be required; there will be two wells of concrete, 20 feet deep and 10 feet in diameter.—J. Lyons, City Engineer.

South Bend, Ind.—The Board of Public Works has ordered the construction of a trunk sewer on Prairie avenue, and pipe sewers in Howard avenue and Vine street.

Vincennes, Ind.—Mayor Greene has recommended the early taking up of plans for sewerage and paving.

Sioux City, Ia.—City is much disturbed over the fact that the proposed Perry and Bacon Creek conduits will cost $17,000 more than the estimate submitted by Engineer Skeels; with extensions contractors have roughly estimated that the Perry street sewer cannot be built for $46,000, while the one on Bacon street will cost $52,000.

Lexington, Ky.—Board of Public Works has appropriated $5,000 for storm water sewers.

Beverly, Mass.—The Aldermen have ordered $15,000 spent on sewers in the Second and Fourth Wards.—Harrie L. Whitney, City Engineer.

Gardner, Mass.—The Sewer Commissioners are considering plans for the construction of additional sewage beds; cost between $20,000 and $30,000.

Lenox, Mass.—Selectman John M. Johnson, of the Committee of Sewers, has announced that $20,000 will be needed to place the Lenox sewage disposal field in the condition recommended by the State Board of Health; more land must be taken and four new disposal beds made.

Ann Arbor, Mich.—City Engineer E. W. Groves has completed plans for sewers in S. Main street and in the Arch and Thayer street sewer districts.

Detroit, Mich.—Council has directed the Department of Public Works to advertise for proposals for the construction of four lateral sewers through alleys.—Jacob J. Haarer, Commissioner.

Ludington, Mich.—City Engineer John A. Mitchell has prepared plans for sewers to include about 1,200 feet of 8 and 10-inch crock tile.—S. G. Martin, City Clerk.

Reed City, Mich.—Engineers McYun & Kellogg, Houseman Block, Grand Rapids, Mich., will prepare plans for 1 mile of concrete trunk sewer of 4 feet diameter.

Ypsilanti, Mich.—Council has decided to build the Bell street sewer; motion was made that the Commissioners of Public Works be authorized to procure materials and begin the construction of the sewer.

Duluth, Minn.—City Engineer McGilvray is drawing plans for a West Duluth main trunk sewer, to be built next summer; it will consist of two intersecting mains; one will be along Sherburne street from Sixty-third to Fiftieth avenues west, and the other will be along the right of way secured by the city along Keene's Creek; plans are also being arranged for a sanitary main trunk sewer at Fifty-fourth avenue east; this avenue will be paved next summer, and City Engineer McGilvray has recommended that the sewer be laid early in the spring, before paving starts, thus saving money and trouble in tearing up the pavement after it has once been laid.

Marshall, Mo.—City is considering a bond issue for construction of sewer system.

Fallon, Nev.—City will install a sewerage and water system; engineer not yet selected; Council is empowered to bond the city for $166,000; slope of land is only about

five feet to mile and disposition of sewage is a serious problem.—C. L. Noble, City Clerk.

Perth Amboy, N. J.—Council has received a petition for a sewer on Parker street and Pulaski avenue.

Trenton, N. J.—Council has ordered a sewer constructed in Paul avenue.—H. B. Salter, City Clerk.

Washington, N. J.—Borough has selected Clyde Potts, Consulting Engineer, 17 Batter place, New York, to design a system of sewers and a sewage disposal plant.—Dr. C. B. Smith, Mayor; A. J. Croft, Borough Clerk.

Long Island City, L. I., N. Y.—Bids will be received February 3, 11 A. M., for constructing a temporary sewer and appurtenances to connect with the St. Nicholas avenue sewer, Second Ward; thence through Grove street to the sewer in Wyckoff avenue, Borough of Brooklyn, and a pumping chamber to connect with a temporary relief sewer in Grove street, from St. Nicholas avenue to Wyckoff avenue, Borough of Brooklyn.—Lawrence Gresser, President Borough of Queens.

Niagara Falls, N. Y.—John C. Stricker appeared before the Board of Public Works and asked that sewers be laid on Seventh street, from Pine avenue to Niagara street; request has also been made for sewers on Fifteenth street, from Walnut to Ferry avenues.

Rochester, N. Y.—Council has received ordinances for sewers in Weaver and Greely streets.

Rochester, N. Y.—Council is considering construction of a sewer in Curlew street: cost, $1,500; in Boss street, $1,200, and a sewer and cement walks on Goodman street, total cost, $3,000.—Wm. Ward, City Clerk.

Watertown, N. Y.—Plans have been completed and same have been approved by the State Department of Health for the Meadow, Pine, West Mullin and Maple street sewers; bids will soon be called for by the Board of Public Works.—H. E. Baker, City Engineer.

Akron, O.—A resolution directing and authorizing the Board of Public Service to advertise for bids for the work of cleaning the catch basins in the city during the present year has been passed by Council.

Chillicothe, O.—Council has instructed H. M. Redd, City Engineer, to prepare plans and estimates for about 2,000 feet extension of Honey Creek storm sewer.

Cincinnati, O.—The Committee on Sewers to whom had been referred the petition of M. L. Andrews & Co., asking for the extension of the Colerain avenue sewer so as to furnish their premises with a sewer connection, has recommended that the Board of Public Service be directed to prepare and submit to Council the necessary resolution to construct the same.

Dayton, O.—City Engineer F. J. Cellarius has estimated the construction of sewers in District No. 4 at $25,950.

Mansfield, O.—The Board of Service has been requested to prepare plans and specifications for a sewer in the alley north of West Fifth street; the Board of Health has recommended the construction of a sanitary sewer in the alley adjacent to the West Fifth street school.

Oxford, O.—On account of a change which has been made in the plans of the sewerage system there will be no pipes laid on High street; instead there will be a line of pipe laid in the alley just south of High, also just north, from College avenue, to Campus avenue.

McAlester, Okla.—Citizens have voted $175,000 sewer bonds.

McAlester, Okla.—Mayor G. M. Chaney has recommended that the present Engineer, J. Phelan, should have charge of the installation of the proposed sewer system and extensions to water system.

Marlow, Okla.—Citizens have defeated proposition to issue $8,000 sewer bonds.

Chambersburg, Pa.—Council is considering an ordinance authorizing the installation of a sanitary sewerage system and a disposal plant.

Chester, Pa.—Council has passed ordinances for the construction of a sewer on Booth street; also 18-inch terra cotta sewers in Patterson, Second, Third and Parker streets.—Wm. T. Cullis, City Clerk.

Portage, Pa.—The Borough Council has decided to submit to the voters at the coming February election the question of issuing $25,000 worth of bonds for the purpose of installing a first-class sewerage system; borough has no general sewer system at present, and because of the rapid growth recently, is beginning to feel the necessity of one; plans for the proposed system have been drawn and, in accordance with the law, sent to Harrisburg for approval by the State Health Department.

Narragansett, R. I.—An act introduced in the Legislature by Representative Caswell will grant to this town the power to issue bonds to the amount of $30,000 for sewer purposes, a project that has long been under consideration, and contemplates a complete change in the sewer system.

Charleston, S. C.—City is considering an issue of from $250,000 to $300,000 of bonds for completing sewer system.—J. H. Dingle, City Engineer.

Mt. Pleasant, Tenn.—City is considering a $150,000 bond issue for construction of sewer system, water works and electric light plant.

Dallas, Tex.—Mayor Hay and the Board of Commissioners have promised the Tenth Ward citizens that a sewer will be built immediately after the beginning of the new fiscal year.

Barton Heights, Va.—Citizens will vote February 23 on $15,000 bond issue for completion of sewer and water systems.

Norfolk, Va.—City Engineer Brooke has been instructed by the Board of Control to begin work as soon as practicable on the construction of a concrete drain in Highland avenue, for which the Councils recently appropriated $600; drain is to take the place of the present wooden bridge over the canal crossing the avenue.

Tacoma, Wash.—Council has instructed City Engineer F. L. Davis to temporarily repair sewers on Yokema street until new sewer is built.

Charleston, W. Va.—Council, January 21, awarded contract for constructing sewers to J. M. Ferry & Sons, notwithstanding that McCracken & Co., of Columbus, O., were $500 low on one kind of sewer and $2,000 on another, as Ferry promised to complete the work 20 days earlier, but on January 26 Council reconsidered the vote and decided to readvertise; McCracken & Co. promise to put up a cash bond of $2,000 that their new bid will be $1,200 less than Ferry's.

Appleton, Wis.—City Engineer McClellan Dodge is preparing plans for a concrete sewer, 4½ inches in diameter.

Baraboo, Wis.—Bids will be received about April 1 for sewerage system to include 700 feet 48-inch concrete pipe, 1,800 36-inch concrete pipe.—J. S. Worthman, Clerk; H. French, City Engineer.

Racine, Wis.—The Committee on Streets has recommended the adoption of resolutions for enlarging sewers in West street.

Toronto, Ont., Can.—The City Engineer has estimated the cost of a system of storm sewers for the whole city; to relieve Garrison Creek sewer, an overflow sewer, cost $190,000; Queen street west sewer, $54,000; Bathhurst street sewer, $28,400; Sorauren avenue, $130,000; central portion of city, $240,000; Lowther avenue and Prince Arthur avenue, $6,400; College street and Dovercourt road, $2,440; Dagmar and Badgerow avenues, $2,100; Queen street, east sewer, $73,000; total, $726,340.

BIDS RECEIVED AND CONTRACTS AWARDED

Oakland, Cal.—Council has awarded contract for sewering Seventeenth street to Robert R. Smith, at the prices named: Furnishing and laying 8-inch pipe, at 74 cents per linear foot; furnishing and laying 8 "Y" branches, at 50 cents each extra; constructing brick manholes, with covers, complete, $40 each.—Frank R. Thompson, City Clerk.

San Francisco, Cal.—The Board of Public Works, January 5, awarded to William & Belser the contract for laying a new sewer in Amazon avenue, between London and Athens street, at $12,192.—Marsden Manson, City Engineer.

Redlands, Cal.—Alexander Rife and O. W. Cave were awarded the contract, January 20, by the City Trustees to build the storm water ditch on Garden street from the Country Club to the head of Cajon street. The ditch will be of cement, six feet wide and deep at one end and three feet wide and deep at the other, and will cost $18,396. The Highway Construction Company, the McIntyre Cement Company and Ernest Frenzell also offered bids that ranged higher, but all were lower than the first proposals a month ago, which ranged from $23,000 to $25,000. The property owners in that section are considering the matter and may elect to do the work themselves at the contract price.

Miami, Fla.—J. D. Godman was low bidder for constructing 1835 feet 24-in 4:9 concrete in trench, average depth 83-4 feet; lime rock to be excavated, for $6.704.19 and $125 for laying, total $6704.19; 400 feet 24-inch cast-iron sand and rock excavation, water to be handled and to be extended into the bay, $1618.09; 512 feet 6-inch terra cotta pipe, laterals to curb line, $743.20; manholes, 8 3-4 feet deep, $49.03 each; rock excavation, $1.78 per cubic yard; sheathing left in trench, $20 per month; wages of common labor, $1.50 per day; totals of bids received: J. D. Godman, $9805.68; Fred Rutter, $12,181.76.—A. H. Adams, City Clerk.

East Point, Ga.—Contracts for sewers have been awarded as follows: Furnishing sewer pipe to Stevens Bros. & Co., of Stevens Pottery, Ga.; for all construction work on sewers to Sullivan & Long, of Bessemer, Ala.—E. H. Davis, Griffin, Engineer.

Cairo, Ill.—The Board of Local Improvements, Mayor George Parsons presiding, received bids, January 20, on the last of the city's new sewer system, comprising what is known as the Thirty-fourth street district, and awarded contract to Garner & Hanes. Tile pipe sewers are to be laid, with house connections to the curb, and brick manholes at intersections; the estimated cost of this improvement by City Engineer Thistlewood is $19,880.55. Bids on the work were received as follows: Garner & Hanes, $17,170.43; Reed Bros., of Belleville, $17,848.77; Roy L. Williams, $17,-392.27; R. E. Gannon & Co., $18,571.30. The bond and contract of Morris Rich for lowering sewer above Thirtieth street have been approved and Mr. Rich will proceed with the work at once.

Winfield, Kan.—J. N. Shackelton has secured the contract for constructing a sewer in District No. 7 at $4,281.

Louisville, Ky.—More bids were received January 22 on Section F of the outfall sewer by the Sewer Commission than have been received on any other contract in the history of the $4,000,000 system; eleven contracting firms bid on the contract, which will amount to a figure close on to $100,000, the largest contract let in months by the Commission. Hoglen, Paul & Kershner, of Dayton, O.; J. Connelly Construction Company, Baltimore, Md.; M. O'Hearn & Co., Pittsburg, Pa.; T. W. Rieley, Baltimore, Md.; C. T. McCracken & Co., Columbus, O.; Ferro Concrete and Construction Company, Cincinnati, O.; Weber & Co., Chicago, Ill.; Y. J. O'Connell, Baltimore, Md.; Fruin-Colnon Construction Company, St. Louis, Mo.; Henry Bickel Company, Louisville; E. G. Nave Bros. Company, Portsmouth, O., were the engineers and contractors bidding to-day. Secretary Charles P. Weaver said that the successful bid appears ot lie between the Fruin Colnon Construction Company and C. T. McCracken & Co. It will require close figuring to determine the lower bid of the two. Section F is about 2,600 feet long and runs from Ninth and Hill streets to Seventh and Davies streets.

The Sewer Commissioners have awarded contracts to Henry Bickel, Louisville, for the construction of the Hoertz avenue sewer and to Scholtz & Vogt, Louisville, for the construction of the Aubin avenue sewer; bids were opened on December 30.—J. B. F. Breed, Chief Engineer.

Billings, Mont.—E. Lindstrom has secured the contract for constructing sewers in Districts 28, 29 and 30, for $8,794.

Long Branch, N. J.—Frank S. Brand, West Long Branch, has been awarded contract for laying sewer to connect the artificial pond on the Guggenheim estate with Takanassee Lake, a distance of 1,243 feet.

Syracuse, N. Y.—The lowest bid opened January 18 by the Board of Contract and Supply for the construction of the Elmwood sewer system was submitted by Frank S. Sposato, at $17,086; other bids received were as follows: Sullivan & Davin, $17,955; Albert Gaffey, $17,987; Saml. Bonn, $18,827; John Young, $19,719; C. T. Hookway, $20,010; P. R. Kieley, $20,765; John W. Bustin, $21,257; Nick Marnell, $21,952, and Jas. Swift, $22,619.

Sylvania, O.—Bids were received as follows January 21 for constructing sewers and appurtenances: Lewandowski & Grzybowski, 239 East Central avenue, Toledo, $7,058; Thomas T. Hurley, Marion, $8,496; J. B. Truman, Lafayette, Ind., $9,011; H. W. Mathews, Lorain, $9,166; Emanuel L. Schneider, Ann Arbor, Mich., $9,271; John McMahon, Toledo, $11,671; M. J. Burke, Sandusky, $12,512. The details of the low bid of Lewandowski & Grzybowski follow: 3,995 feet 8-inch sewer pipe, laid, 15 cents; 615 feet 10-inch, 20 cents; 3.228 feet 12-inch, 25 cents; 130 cubic yards trenching and backfilling, under 6 feet, 22 cents; 830 cubic yards, 6 to 8 feet, 30 cents; 3,115 cubic yards, 8 to 10 feet, 35 cents; 1,400 cubic yards, 10 to 12 feet, 55 cents; 1,030 cubic yards, 12 to 14 feet, 70 cents; 915 cubic yards, 14 to 16 feet, 90 cents; 16 to 18 feet, $1.50; 18 to 20 feet, $2; 12 manholes, $30 each; 4 drop manholes, $40 each; 3 flush tanks, $50 each; 12 feet 45-100 ton cast-iron pipe, laying per foot, $1; 12 feet 45-100 ton cast-iron pipe, furnishing, per ton, $45; 200 cubic yards embankment, 35 cents; sewers, $5,984. Disposal beds: 1 screen chamber, $75; 480 feet 6-inch sub drains, 30 cents; 345 yards sand for filters, $1; 135 yards gravel for filters, $2; 780 M. feet B. M. lumber in carriers, $35; 1 manhole, $30; 385 linear feet 10-inch sewer pipe, laid, 60 cents; 18 cubic yards masonry, concrete, $6; 480 cubic yards ex-

cavation in filters, 30 cents; extra concrete, per cubic yard, $5; 4-inch house connections, per foot, 40 cents; 6-inch house connections, per foot, 50 cents; old sheeting in trench, per M. B. M., $15; new sheeting in trench, per M. B. M., $30; extra earth excavation, per cubic yard, 60 cents; rock excavation, per cubic yard, $5; timbering in foundation, per M. B. M., $30; disposal, $1,074.

Youngstown, O.—Bids for three improvements were opened at the Board of Public Service, January 25, by Clerk McMillin, and Mullen and Caldwell are the low bidders for paving Bryson street and Park View avenue with brick, their bid being $3,636.32; E. Diorio is now low bidder for the Walnut street sewer with a bid of $532.47, and Patrick Grady for the Wellendorf avenue sewer, at $1,952.20.

Shawnee, Okla.—The Metropolitan Engineering and Construction Company, of Kansas City, Mo., has contract for the proposed storm sewer.

Park City, Tenn.—Council, on January 26, let the contract for the construction of eight of the proposed sections of sewers; bids were submitted for nine sections, but the eighth section was eliminated and John L. O'Connor, being lowest bidder, was awarded the contract for $14,368.25; work will be commenced at once, and Mr. O'Connor expects to complete the 27,000 linear feet of sewers by May 1; connections of which there are to be 396, cost on an average, $41 each.

The total bids for the nine sections and the "Y" are as follows: H. C. McCrary, $28,283.21; J. A. Hannifin, $19,637.58; F. E. Brady, $24,885.45; Curran Construction Company, $24,867.22; Bosler & Flynn, $30,-520.45. John L. O'Connor bid upon the whole nine sections. His bid for the work upon all the sections was $18,700; eliminating the eighth section, Mr. O'connor bid $14,368.25; the highest bid after eliminating section 8 was that of H. C. McCrary, which was $24,773.21; Bosler & Flynn's bid for all sections except the eighth was a total of $24,473.45. The second lowest bidder, J. A. Hannifin, who bid upon all sections except the eighth, $15,062.37, or $754.12 higher than the successful bid.

Eight bids for the nine sections were made upon the yardage basis. Each bidder gave separate prices upon the following items: 17,500 feet 8-inch sewer pipe; 6,880 feet 10-inch sewer pipe; 2,310 feet 12-inch sewer pipe; 380 feet 15-inch sewer pipe; 210 feet 12-inch cast-iron pipe, 80 feet 15-inch cast-iron pipe; 341 yards 8 by 6 inches; 15 yards 10 by 6 inches; 85 manholes; 5 lampholes; 50 yards of concrete; 4,400 yards solid rock. Each bidder offered to construct the nine sections complete for the following amounts: Thomas McFarland, $23,216.30; Curran Construction Company, $27,340.83; Borches & Waldrep, $25,126.80; J. A. Ahler, $23,331.45; H. C. McCrary, $24,498.11; J. A. Hannifin, $24,-003.18; F. E. Brady, $32,017.70; Long & Price, $24,087.74. The committee found that all these bids were too high for consideration.

Dallas, Tex.—Bids on an eight-inch sanitary sewer in Oak Lawn, along Fairmount, Throckmorton and Routh, to connect with the Oak Lawn sewer, were opened and referred to Commissioner Sullivan. They were: C. W. Olcott, $5,500; George S. Vivian Company, $6,408.40; Dallas Home Improvement Company, $4,969; Dallas Lime and Gravel Company, $5,634.

Houston, Tex.—Council has awarded contract for sewer connection to the catchbasin to Horton & Horton, the lowest bidders; three bids were filed for connections, two of which were $1,800, while that of Horton & Horton was $1,021.

Midland, Tex.—City has awarded Contract to O'Neil Engineering Company, of Dallas, for construction of system of sewers and water works to cost $100,000.

Norfolk, Va.—Bids were opened January 22 by the Board of Control for a six months' supply of lumber, cement, granite block, drain tile, terra-cotta pipe, curbing and castings, but contracts were awarded only for the lumber, piping and drain tile, consideration of the other quotations being deferred. The contract for the drain tile was awarded to Batchelder & Collins, at $14.50, $21.50 and $32 per 1,000 feet of the 2-inch, 3-inch and 4-inch sizes, respectively; the piping will also be furnished by Batchelder & Collins, at 78 per cent. of the list price; the lumber contract was let to J. E. Etheridge Lumber Company, Inc., at prices ranging from $16 to $20 per thousand, according to size and grade.

Charleston, W. Va.—City had awarded contract to J. M. Ferry & Sons, of Charleston, for sewer construction, at $22,801, but later reconsidered, rejected all bids and decided to readvertise.—James A. Holley, Mayor; W. A. Hogue, City Engineer.

Parkersburg, W. Va.—R. T. Martin, city, has contract at $5,918.69, for construction of sewer on various streets in Seventh Ward.

Hamilton, Ont., Can.—The Sewer Commission, January 20, awarded to the Hamilton Bay Improvement Company the contract for pile driving in connection with the extension of the Ferguson avenue and Catharine street sewers, through the revetment wall, at 27 cents per foot; the City Engineer's Department was instructed to proceed with the balance of the work by day labor.

WATER SUPPLY

Ensley, Ala.—Hugh Friel and associates of North Birmingham, who proposed to build an extensive water works to get the supply from Mulberry Fork of the Warrior River, have applied to the Council for a franchise to run pipes through the city and conduct a water works business.

Faunsdale, Ala.—City is considering the installation of a water works and electric light plant.—Siddons Stollenwerck, Town Clerk.

Samson, Ala.—City has selected Howard Butt, 121 Sayre street, Montgomery, Ala., as Engineer to construct the water and light system at Samson; $25,000 bonds recently voted have not been sold as yet.—Mayor W. J. Gresham.

Bisbee, Ariz.—City Engineer McNiesh has submitted plans for the proposed water system; there will be 75 hydrants and 15 sprinkler water connections.

Phoenix, Ariz.—The high premium of $4,-548 will be paid by the Provident Savings Bank and Trust Company, of Cincinnati, for the remaining $60,000 worth of Phoenix City Water Works bonds.

Harrison, Ark.—Citizens are urging the installation of a water works system.

Hartford, Conn.—Engineer E. M. Peck, of Water Commissioners, has prepared plans for improving water system during 1909; cost of the whole work proposed will be approximately $200,000; about $50,000 will be required to complete the "East Side" system; mains will be laid in about 50 streets.—Henry Roberts, President of Board.

New Britain, Conn.—Mayor Landers has offered the resolution in Council that the Corporation Counsel be instructed to take such preliminary steps as may be necessary on behalf of the Water Department to enable it to acquire rights for additional watersheds for the Burlington system.

Waterbury, Conn.—The Board of Commissioners has ordered City Engineer R. A. Cairns to prepare estimates for laying water mains in Baldwin, East Main, Grand, Leavenworth and Meadow streets.

Quincy, Fla.—City will issue bonds for extending the water plant.

Willacoochee, Ga.—Town will receive bids February 8 for $14,000 water and light bonds.—W. Moore, Town Clerk.

Newman, Ill.—Citizens are urging the installation of a water works system.

Jasonville, Ind.—Town is considering plans to secure a supply from Muir's Lake.

Salem, Ind.—Citizens have voted to enlarge the water works.

Shirley, Ind.—Citizens will vote February 6 on installation of a water works system.

Council Bluffs, Ia.—C. S. Burns, of the firm of Burns & McDonnell, of Kansas City, has stated that complete plans and specifications for the contemplated municipal water works system will probably be ready within thirty days; Burns & McDonnell were engaged by the Water Committee of Council some time ago to aid City Engineer Etnyre in the preparation of the plans referred to; firm expects to submit to the city engineer, within a month, its portion of the specifications, covering machinery and installation, tests, examination and other work of a similar character; City Engineer Etnyre has practically completed his plans and specifications for the distributing system and for the pumping station and other necessary buildings.

Earlham, Ia.—Citizens have voted to install a water works system.

Mt. Ayr, Ia.—Town is considering installation of a water works system this year.

Perry, Ia.—City has not yet selected an engineer for the building of the water works plant; cost, $15,000.—Adrian Cross, City Clerk.

Carlisle, Ky.—A Louisville concern has sent a proposition to the Commercial Club for the installation of a system of water works.

Lexington, Ky.—Fire Chief Jesse has recommended the installation of 17 new fire hydrants.

Brewer, Me.—Citizens may vote upon establishing a water district or forming a private corporation to take over and rebuild the present system.

Bondsville, Mass.—Representative Hobson, of Palmer, has filed with the Clerk of the House a bill to extend the provisions of the charter of the Boston Duck Company of Bondsville in the town of Palmer, so as to permit the company to sell water to residents of this village.

Cliftondale, Mass.—Fire Chief Weber and others are urging better water service.

Saugus, Mass.—Citizens are urging the extension of the water system to North Saugus.—Dr. Ernest Homan, Chairman Citizens' Committee.

Duluth, Minn.—Bids will be readvertised for brass curb and corporation cocks under new specifications.

International Falls, Minn.—Bids will be received February 20 for $22,000 bonds for the construction of a water works system.—F. B. Green, Village Recorder.

Jackson, Minn.—Citizens have voted $10,000 bond issue for water works improvements.

Alton, Mo.—An expert hydraulic engineer from Pittsburg, Pa., will inspect the water works pumping station very soon and will recommend costly improvements; it is proposed to install a new pump with a capacity of about 6,000,000 gallons a day.

Marshall, Mo.—City will issue bonds to perfect system of water works now being constructed.

St. Louis, Mo.—Water Commissioner Adkins has recommended the construction of a new intake station at Bissells Point to protect the water supply in times of low water; new plant would require new boilers and engines, new pipe, a coagulant system and intake tower, and cost about $1,000,000.

Kennard, Neb.—Charles P. Chase, Hydraulic Engineer, of the Iowa Engineering Company, Clinton, Ia., has been selected by the city to prepare plans for a system of water works.

Lincoln, Neb.—City is having plans and specifications prepared for a 1,000,000-gallon reinforced concrete reservoir.—William Grant, City Engineer.

Fallon, Nev.—City will install a municipal water and sewerage system; engineer not yet selected; Council is empowered to bond the city for $166,000; plans contemplate the erection of an elevated tank, 125 feet high, with a 100,000-gallon capacity and laying of 6-inch water main with lead joint pipe; water can be obtained at a depth of from 25 to 30 feet, or as there is a 26-foot drop in one of the main government canals four miles from town, this might be utilized.—C. L. Noble, City Clerk.

Asbury Park, N. J.—Superintendent I. L. Coffin has asked Council for a $900 station meter, 11 new hydrants; also new meters, to cost $600; laying of a new 6-inch main on Fourth avenue and installation of coal conveyor at South Main street pumping station.

Atlantic City, N. J.—The Water Commissioners are considering plans for the construction of a 40-inch water main across the meadows, between Pleasantville and Atlantic City.

Elmer, N. J.—A petition is in circulation asking the Borough Council to fix a date for a special election to decide on issuing bonds for building water works in Elmer; an approximate cost of the plant is $30,000.

Brooklyn, N. Y.—Wm. C. Cozier, Deputy Commissioner of Water Supply, Gas and Electricity, has asked for an appropriation of $1,200,000 for extending the protected district from the Navy Yard to Newtown Creek, the boundary line between Brooklyn and Queens, and from Erie Basin on the South Brooklyn water front to Sixty-fifth street, Bay Ridge.

Kingston, N. Y.—City has purchased land and will enlarge reservoir No. 1.

Poughkeepsie, N. Y.—Property owners on Innis street have petitioned for a water main and sewer through that street from Main to Queens street; residents on Spruce street for an extension of main from Albany to North Water street.

Rockaway Beach, L. I., N. Y.—Renewed interest is being taken at Broad Channel, the thriving settlement along the railroad trestle on the road to Rockaway Beach, in the movement to have the Queens County Water Company at Far Rockaway lay a main along the railroad trestle to the channel in order that the residents may have a fresh water supply.

Spencer, N. C.—East Spencer will ask Legislature for authority to issue $25,000 water and light bonds.

College Hill, O.—Geo. Hornung & Son, of Cincinnati, O., have been selected as Consulting Engineers to report on the feasibility of furnishing a water supply to the town of Mt. Healthy; additional machinery may be installed.

Hamilton, O.—The Board of Public Service has asked for a $10,000 appropriation for the extension of water mains in the suburbs.

Toledo, O.—The Sub-committee of Council has approved plan for water mains for the proposed high-pressure auxiliary system which will cost $70,000 for the pipe and laying.

Toledo, O.—The Finance Committee has authorized another $100,000 filtration plant bond issue; this will complete the plant.—G. W. Tonson, President.

Wynnswood, O.—Council has instructed Mayor T. P. Rollow to call a $15,000 bond issue, $7,500 to be used in moving water works nearer home and the possible erection of a stand pipe, and $7,500 for the erection of a City Hall and Fire Department headquarters.

Enid, Okla.—City will purchase 35,000 feet of 6-inch cast-iron pipe, Class C, standard specifications; 4,700 feet of 8-inch cast-iron pipe, Class C, standard specifications; 1,200 feet of 4-inch cast-iron pipe. Class C, standard specifications; 50 hydrants, 37 6-inch double brass-lined gate valves, four 8-inch double brass-lined gate valves, and six 4-inch double brass-lined gate valves.—C. H. Sexton, City Engineer.

Hartshorne, Okla.—The O'Neil Engineering Company, Dallas, Tex., has prepared plans for water works; cost, $80,000; bids for material will be advertised.—W. E. Robbins, City Secretary.

Marlow, Okla.—Citizens have voted $8,000 6 per cent. water works bonds.

McAlester, Okla.—City has voted $20,000 bonds for water extensions.

McAlester, Okla.—Mayor G. M. Chaney has recommended that the present Engineer, J. Phelan, should have charge of the installation of the proposed extension to water system and sewer system.

Hood River, Ore.—Citizens will vote March 25 on $200,000 bonds for the erection of a water and light plant.

Portland, Ore.—The Water Committee has appointed Dr. C. H. Raffety, Dr. S. E. Josephi, George W. Bates, William Ladd and Frank T. Dodge as a committee which will have entire authority to construct the additional pipe line from Bull Run to this city and construct the necessary reservoirs, as proposed under the $3,000,000 bond issue in the hands of the five men named.

Bethlehem, Pa.—If the citizens vote to establish a municipal water plant, Council will lay water mains to connect with the municipal plant.

Catasauqua, Pa.—G. Cadogan Morgan is the Engineer in charge of the installation of a water works system.

Chambersburg, Pa.—Council is progressing in the matter of establishing a filter plant at Silcam; the Roberts Filter Company of Philadelphia has made a proposition.

Ridgeway, Pa.—Citizens will vote February 16 on $8.500 bonds to improve and extend water works system.—J. C. Millan, President Town Council.

Scranton, Pa.—The City Water Company has petitioned Council for a franchise for water works.—Ex-Mayor Alex. Connell, Promoter.

Fort Getty, R. I.—The U. S. Government has rejected bids for the construction of water supply and sewer systems; plans and specifications will be modified and work readvertised soon.—Willis C. Metcalf, Captain, Q. M., U. S. A., 209 Thomas street, Newport, R. I.

Wolsey, S. D.—Citizens may vote on a $6,000 bond issue for improving water works system.

Jellico, Tenn.—J. B. McCrary & Co., of Atlanta, Ga., have examined the sources of supply and prepared plans for the proposed water works system; Jellico, Ky., may join in taking water from the same source.

Memphis, Tenn.—John K. Watkins, of 2 Wall street, New York City, was the only bidder for $1,000,000 water department bonds; his bid at par and accrued interest has been accepted.

Mt. Pleasant, Tenn.—City is considering a $150,000 bond issue for construction of water works, sewerage system and electric light plant.

Anson, Tex.—The O'Neil Engineering Company, Dallas, Tex., has been selected to prepare plans for a system of water works; cost, about $20,000.

Dallas, Tex.—Forty-two hundred feet of the wooden conduit between the Elm Fork pumping station and the Turtle Creek reservoirs is to be replaced with either a 36-inch or a 42-inch cast-iron conduit, and it is not unlikely that a new right of way for the conduit will be secured; pipe and its laying will cost either $28,000 or $37,000, depending upon the size used, and it is expected that some additional expense will be encountered in securing a suitable right of way; matter has been brought to the attention of the Commissioners by Commissioner Sullivan, who had received a communication from Chief Engineer Bassett stating that the present wooden conduit is leaking badly in places and recommending the substitution of a cast-iron conduit.

Denison, Tex.—As soon as the bonds voted by the people, January 20, amounting to $50,000, can be drafted, printed and approved, they will be offered for sale and the money derived therefrom will be devoted to the construction of an enormous dam and reservoir in Shawnee Creek Valley, three miles north and west of the city.

Ennis, Tex.—Citizens have voted $13,000 bonds for the installation of a new system of water works.

Hansford, Tex.—Citizens may vote on installation of a water works system.

Lufkin, Tex.—Council is discussing the question of constructing water works.

Marlow, Tex.—Citizens have voted $8,000 in 6 per cent. water works bonds; this will enable the town to make much needed extensions of the water and electric light service; sewer bond proposition of $8,000 was lost.

Murray, Utah.—City is considering purchase of the water works system owned by the Progress Company.

Park City, Utah.—The Kearns and the Park City Light, Heat and Power Company have asked for franchises to furnish the citizens with water; a hydraulic engineer will probably be hired by the city to figure out the required needs of a first-class water works system before franchises are acted on.

Barton Heights, Va.—Citizens will vote February 23 on $15,000 bond issue for completion of water and sewer systems.

Clifton, Va.—Citizens will vote on municipal ownership of the water works system.

Lynchburg, Va.—Water Department will ask City Council for appropriation to provide adequate water facilities for fire protection; cost, $20,000; improvements will include new water main 12 or 18 inches in diameter; cost, $30,000; Department will also ask for sufficient appropriation for completion of work in annexed territory.—H. L. Shaner, City Engineer.

Portsmouth, Va.—The Edgewater Company has transferred to the Norfolk County Water Company the rights and privileges to lay, maintain and repair water mains in Read, Gill and Argal avenues, Rolfe avenue, Powhatan avenue, Studely avenue, Edgewater drive and Bolling avenue, on the plat of Edgewater.

Urbanna, Va.—City will advertise for bids at once for furnishing water.

Barre, Vt.—City Engineer has recommended the installation of a storage reservoir.

Tacoma, Wash.—The Tacoma Water Supply Company has asked the city to locate every fire hydrant in the territory served by the company.

Wheeling, W. Va.—As soon as the legality of the $350,000 bond issue, lately voted, is determined, a new system of getting the water supply of the city and a new pump will be installed at the water works.

Sparta, Wis.—The Board of Water Commissioners is considering plans for the erection of a water tower; cost, about $3.500.—H. Teasdale, President.

Zanesville, Wis.—Two committees of prominent Zanesville citizens will go to Columbus in the endeavor to influence the State Board of Health to decide on a well system of filtration for Zanesville, while Dr. J. C. Crossland, member of the State Board, who believes a mechanical filter would be best, will address the Board from that standpoint.—E. M. Ayres, Chairman of the Chamber of Commerce Committee.

Aylmer, Ont., Can.—Citizens will vote on $50,000 bond issue to purchase present water works system.

BIDS RECEIVED AND CONTRACTS AWARDED

Denver, Col.—The Central Colorado Electric Power Company has closed a contract for building the Barker reservoir dam in Boulder County at a cost of $600,000; the new dam will be the largest in Colorado and will impound 500,000,000 cubic feet of water.

Wellington, Kan.—The contract for the erection of a water tank, 140 feet high and a capacity of 150,000 gallons, has been awarded by the city to the Des Moines Bridge and Iron Works, Des Moines, at $6,474.

Baltimore, Md.—Sherwood Brothers have been awarded contract for furnishing the Water Department with lubricating oil.

Duluth, Minn.—The Board of Water and Light Commissioners, January 21, received bids for about $10,000 worth of supplies for the coming year and awarded contracts; the bids were on lead pipe, galvanized iron pipe, brass curb and corporation cocks, curb boxes and solder. The bids of Crane & Ordway, of Duluth, on lead pipe and galvanized iron pipe, were accepted. The lowest bid on lead pipe was $4.95 per 100 pounds. Other bids received were $5.07 and $5.22. The bids on galvanized iron pipe were for about 20,000 feet. Crane & Ordway bid $1,400.03. One other bid of $1,654.97 was received. The contract for the brass goods was not let. The manager was instructed to advertise for new bids, giving other specifications, which were omitted in the original advertisement. The bid of the Mueller Manufacturing Company of 94½ cents each on curb boxes was accepted. The only bid was at $1.10. The bid of the Marshall-Wells Hardware Company for furnishing solder was accepted at $14.85 per 100 pounds. Other bids received were at $16 and $16.64.

Grand Forks, N. D.—Contract for constructing an addition to the settling basin has been awarded to Dinnie Brothers, city, for $4,347.—W. H. Alexander, City Auditor.

Hastings, Okla.—City has awarded contract to O'Neil Engineering Company, Dallas, Tex., for construction of water works, to cost $25,000.

La Grande, Ore.—The Mayor and Recorder, January 21, entered into a contract with the American Light and Power Company, of Kansas City, for a $160,000 water system, the water to be brought from Beaver Creek, eighteen miles away, to the city reservoir, with a 300-foot head; the citizens have been trying to procure this system for several years.

Philadelphia, Pa.—Bids were opened January 25 as follows by the city for the construction and equipment of a high-pressure fire pumping station at Sixth street and Lehigh avenue and for furnishing and laying mains in the northeast section of the city for such service: For pump building, engines and pumps: Millard Construction Company, Pennsylvania Building, various styles of engines and pumps, $360,000, $367,000, $373,000, $380,000 and $389,000, time 400 days; John R. Wiggins & Co., Heed Building, $370,000, $385,000 and $425,000, time 250 days; J. G. Doak & Co., 1420 Chestnut street, $370,980, $397,980 and $426,812, time 320 days; Edward F. Fonder Co., Land Title Building, $385,000, time 300 days; Michael O'Rourke, $467,000, time 300 days; for excavating trenches, laying connecting mains and repairs to the Fairhill reservoir: Millard Construction Company, $9,800; Michael O'Rourke, $12,500; M. & J. B. McHugh, Witherspoon Building, $15,000. The engines and pumps are to be of the gas-driven type, with an aggregate capacity of 12,350 gallons of water per minute, against a pressure of 300 pounds per square inch at the pumps. Against the like pressure at least one unit of engine and pump must have a capacity of 350 gallons per minute; $500,000 is available.—George P. Stearns, Director of Public Works.

Midland, Tex.—City has awarded contract to O'Neil Engineering Company, of Dallas, for construction of proposed system of water works and sewers, to cost $100,000.

Norfolk, Va.—J. W. Gamage & Co. were awarded the contract, January 26, by the Board of Control for supplying the city with pipe and fittings for the remainder of the fiscal year.

Tacoma, Wash.—D. A. Williams has been given the contract for enlarging the middle service reservoir on Alaska street for $24,740; the present capacity of the reservoir is 4,000,000 gallons; it will be increased to 11,000,000 gallons. There were two other bidders, Joe Well, who submitted a proposal of $24,972, and the Coast Contracting Company, $27,134. Williams, who was given the contract by Commissioner of Public Works H. J. McGregor, is now engaged in constructing a new reservoir at Thirty-first street and Yakima avenue for the low service.—A. J. Whitney, Engineer Water Works.

LIGHTING AND POWER

Birmingham, Ala.—Louis Pizitz and Sol. Capen are promoters for the construction of an electric light plant.

Bisbee, Ariz.—Council has appointed a committee with power to act and install a fire alarm system of not less than 20 boxes; cost, $4,100.

Dermott, Ark.—City will enlarge and operate electric light plant.

Mammoth Spring, Ark.—The Mammoth Spring Electric Light Company will at once rebuild the power plant destroyed by fire.

Paragould, Ark.—City has granted a franchise to the Crystal Ice Company to install an electric light plant for lighting the streets.

Los Angeles, Cal.—The Edison Electric Company is considering plans for the replacing of power house No. 7 in Mill Creek Canyon by a larger one.

Magalia, Cal.—The power house of the Steifer mine, which was destroyed in the collapsing of the dams, will be restored immediately.

Placerville, Cal.—W. P. Hyatt has filed an appropriation of 2,000 inches of water flowing in the north fork of the Consumne River for power and other purposes.

Redlands, Cal.—The City Trustees have again postponed action on the street lighting contract of the city; action has been taken on motion of Trustees Cheesman previous to any discussion, though Manager A. L. Selig, Director Henry Fisher and several stockholders of the Edison Electric Company and Manager Chesnut and Attorney Halsey W. Allen of the Home Gas Company were present, ready for the discussion.

Redwood City, Cal.—City is receiving bids for constructing an extension of the municipal electric distributing system.

San Andreas, Cal.—The Mokelumne River Power and Water Company has filed an appropriation of 5,000 inches of water in the south branch of the Middle Fork

of the Mokelumne River, to be diverted into Cadish Ditch.

Yreka, Cal.—The Siskiyou Electric Light and Power Company will extend its line at once from Montague to Dunsmuir; another 1,500-h.p. generator will be installed at Fall Creek.—J. W. Churchill, President and Manager.

Hartford, Conn.—The Board of Public Works has recommended the placing of six arc lights.

Norwich, Conn.—The Board of Gas and Electric Commissioners are considering plans for changes in the municipal electric light plant, which include discontinuing the use of the rotary converter and changing all 500-volt, direct-current motors for alternating-current motors.—William F. Bogue, Manager.

Waterbury, Conn.—The Board of Commissioners has ordered lights installed at State street on the Watertown road, Wildwood avenue and at Bank and Canal streets.

Mulberry, Fla.—The Prairie Pebble Phosphate Company has selected the Holmboe Company, Lincoln Savings Bank Building, Louisville, Ky., as Consulting Engineer and Superintendent for power house and boiler house; work on these buildings will consist of fireproof buildings to take the place of old buildings; no machinery is required.

Ashburn, Ga.—Citizens have voted $55,000 electric light, water works and school bonds.

Atlanta, Ga.—Piedmont Power Company is considering plans for the construction of water power electric plant; capital, $3,000,000; offices, 811 English-American Bldg., Atlanta.—J. S. B. Thompson, Secretary-Treasurer.

Payette, Ida.—City has granted an electric lighting franchise to the Idaho-Oregon Light and Power Company.

Orofino, Ida.—Town has granted a franchise to F. J. Englehorn and K. G. Osterhout, of Nez Perce, for an electric light and power plant.

Wallace, Ida.—The Slate Creek Electric Company will build a $200,000 power plant to be operated by water power from Slate Creek, as soon as the weather is settled; plant will generate 15,000 horsepower.—H. J. Rogers, Vice-president.

Chicago, Ill.—Bids will be received, February 3, noon, by Trustees Sanitary District of Chicago, for furnishing and installing (1) transformers, and (2) alternating current wattmeters.—I. J. Bryan, Clerk, American Trust Building.

Chicago, Ill.—Engineers D. C. and Wm. B. Jackson have recommended the installation of seven gas testing stations each to be equipped at a cost of $1,500.

Rock Island, Ill.—City Clerk Martin T. Rudgren has received the prepared copies of the specifications for the mechanical filtration plant which were prepared by City Engineer Treichler and gave one to each of the members of Council; specifications are general and only set forth the conditions upon which the contract will be let, the requirements and qualifications of bidders, what will be demanded in material and the character of construction wanted.

Greencastle, Ind.—The Board of Trustees of the De Pauw University will construct a new electric light plant this year; cost between $4,000 and $5,000; whether a new building addition to the present heating plant will be built has not been decided.—R. L. O'Hara, President.

Lafayette, Ind.—The Ft. Wayne & Wabash Valley Traction Company will soon begin work on the complete remodeling of its power house in this city, which will transform the plant into one of the largest and most perfectly equipped electric power stations in the Middle West; remodeled plant will serve a double purpose, being used to generate power for the traction line and also to furnish power for the Indiana Lighting Company, which owns electric light franchises and plants in a number of Indiana and Ohio cities. Between $100,000 and $200,000 will be expended on the plant, which will be equipped with modern turbine generators, and will serve as a twin plant to the monster power house at Ft. Wayne.

Medaryville, Ind.—Town Board will receive bids for construction and equipment of an electric light and power house plant.

Vincennes, Ind.—Mayor Green has recommended that bids be invited without delay for furnishing street lights; present contract is with the City Electric Lighting Company.

Winamac, Ind.—The Town Boards of Francesville, Medaryville and Monon have decided to build jointly an electric power house in one of the towns to supply electric light for the three; towns are situated about eight miles apart on the Chicago, Indianapolis & Louisville Railroad; Francesville and Medaryville are in Pulaski County, and Monon in White County; they are each places of about 1,200 population and are without electric service; plan proposed is to build the plant at Medaryville, the central town, and have the current carried by lines to Monon and Francesville.

St. Paul, Ind.—Council will soon ask bids for wiring the town for an electric lighting system; plan is to secure current from the Indianapolis & Cincinnati Traction Company.

Iowa City, Ia.—Citizens will vote, February 10, on granting a franchise to the Iowa City Electric Light Company.

Iowa City, Ia.—Council has authorized City Clerk Slater to receive bids for wiring the City Hall for electric lighting, not to include the fixtures.

Oelwein, Ia.—The Oelwein Light, Heat and Power Company will expend $35,000 in improvements during the coming year.

New Cambria, Kan.—Town is considering installation of electric lights, as Chas. Kirtland is to establish a dynamo on the Smoky River.

Parsons, Kan.—The Parsons Street Railway and Electric Company has purchased the Parsons electric light plant and will spend $50,000 on the rebuilding of the plant.—H. R. Sullivan, Secretary and Treasurer.

Pineville, Ky.—City has prepared ordinance and will soon advertise for bids for 20-year franchise to construct electric lighting and power system; plant to be of at least 180 kilowatts capacity and be equipped with two or more dynamos, directly connected, neither of which to have capacity of less than 80 kilowatts, and also be provided with two or more engines, each to have capacity sufficient to operate respective dynamos.—B. H. Broughton, City Clerk.

Shreveport, La.—M. Barnedum, of Pittsburg, Pa., a member of the Barnedum-Trees Oil Company has just announced that he has obtained control of all of the Barnsdale natural gas property in the Caddo field, and that he will pipe the product to Marshall, Tex., to compete for business there and build a line to Shreveport to compete with the companies here.

Augusta, Me.—With the object of obtaining legislative authority to build a dam on the Magalloway River and create a new basin in order to increase and make more constant the flow of water in the Androscoggin River and for use for power and manufacturing purposes, Senator Osgood of Androscoggin has introduced in the Senate a bill to incorporate the Androscoggin Reservoir Company; following incorporators have been named: William P. Frye, Hugh J. Chisholm, Herbert J. Brown, Francis W. Fabyan, Waldo Pettengill, A. N. Fairbanks and Wallace H. White; corporations directly interested in making this improvement and represented by the incorporators are the Union Water Power Company, the Berlin Mills Company, the International Paper Company and the Rumford Falls Power Company and the rights of the Magalloway Dam and Improvement Company; plan contemplates the erection on the Magalloway River of a dam at a cost of about $300,000 and the formation of a storage basin capable of holding about 8,000,000,000 cubic feet of water, or about one-half of the quantity retained by the dams of the Union River Power Company at the outlets of four lakes; when filled with water a lake will be formed about twelve miles long and of an average width of about a mile.

Denton, Md.—Thomas F. Garey, President Peninsular Light and Power Company, 16 East Lexington street, Baltimore, will receive proposals about April 1 for machinery and construction of water-power electric light plant at Denton.

Friendsville, Md.—Youghiogheny Power Company has been incorporated to develop water power and build electric plants on Youghiogheny River and tributaries in Garrett County; Clifford L. Pullen, Willard Brown and Herbert Crane, of New York City; Carleton M. Moody, of Philadelphia, Pa., and William A. Morgart, of Cumberland, Md., incorporators.

Marion, Mass.—A private company composed of Marion and Wareham men are discussing the matter of lighting the two towns as a private corporation from the same central lighting plant.

Worcester, Mass.—The Local Wire Commission, City Engineer F. H. McClure and Street Commissioner Geo. C. Moss have completed plans of that part of the city in which wires are to be buried this year; section extends from Millbury and Endicott streets to Middle River and to the Norwich & Worcester Railroad and to the South Worcester Junction, through Ellsworth.—H. A. Knight, Superintendent of Wires.

Chelsea, Mich.—The Michigan Central Railroad Company will equip its terminals in Detroit and the main line as far west as Ypsilanti, Mich., a distance of 30 miles, with electricity; it is proposed to use electric cars for local business; electricity for operating the system will be furnished by a hydro-electric plant to be constructed on the Huron River at Chelsea, Mich.—G. H. Webb, Detroit, Chief Engineer.

Detroit, Mich.—The Public Lighting Commission has cut Supt. F. T. Mistersky's estimate to $390,000; two automobiles for the inspection and quick repair departments are included in the estimates; there is also a site for an addition to the present building, for use as a blacksmith and machine shop; new sub-station in the northwestern part of the city will cost about $45,000; operation and maintenance, $187,000.

Albany, Minn.—Village Council has rejected all bids for installing a light system.—Thomas Tomasek, Village Recorder; Edmund T. Sykes, Engineer, Minneapolis.

Albert Lea, Minn.—The Albert Lea Light & Power Company will make extensions and improvements to its plant; plans and specifications have been prepared; work will include the installation of a 200 or 300-kw. unit, a 200-hp. boiler, 100-kw. motor generator, transformers, three miles of pole line and five miles of gas mains.—Ludwig Kemper, Manager and Treasurer.

Hattiesburg, Miss. — The Hattiesburg Traction Company will erect a large new power house.— N. B. Blount, Secretary.

Pass Christian, Miss.—The first survey for the proposed electric railroad over Second street in Pass Christian has been started; Fred McCutchon, Chief Engineer of the Gulfport & Mississippi Coast Traction Company, with a force of men have made a complete survey of the street the distance of a mile or more; city has a contract with the Traction company to have in operation in this city an electric light plant by the 1st day of April next, and it is the wish of the railroad company to construct both the electric light and the railroad system at the same time, which, if they are able to do, all put both these acquisitions in operation here about the 1st of July.

Bethany, Mo.—Plans are being made to increase the output of the municipal light plant; a new generator will be installed.—J. F. Slinger, Superintendent.

Omaha, Neb.—Omaha & Council Bluffs Street Railway Company has bought a large plot of ground adjoining its power plant on the south for the plant's enlargement. This is known as sub lot No. 1 of government lot No. 3 and is 142x284 feet.

Antrim, N. H.—The Goodell Company will develop a water power at North Branch, about four miles from Antrim; a 500-kw. generator will be installed and power, which will be about 500 horsepower, transmitted to the village.—David H. Goodell, President; H. A. Hurlin, Secretary.

Jersey City, N. J.—The Street and Water Board has voted to place three electric lamps on Gates avenue, between Old Bergen road and the Hudson boulevard, as was requested by the Seventh Ward Improvement Association.

Montclair, N. J.—Mayor Crawford has recommended that The Crescent and Lincoln street be improved by lighting.

Artesia, N. M.—City has granted a franchise to O. S. Coates to erect an electric lighting plant.

Bergen, N. Y.—Village has sold $6,000 bonds for the establishment of an electric light system to G. M. Mann, of New York City.

Carthage, N. Y.—The Carthage Electric Light and Power Company is considering the installation of a 400-kw. generator on a new line from Carthage to the plant.—S. M. Strickland, Manager.

Rochester, N. Y.—The Rochester Railway and Light Company will erect a one-story electric substation; cost, $15,000.

Rochester, N. Y.—As a result of a conference between the City Engineer and the Rochester Railway and Light Company it has been decided to cut down the overhead wires and remove the poles in Central avenue, between St. Paul and Clinton avenue North, River street, and that part of St. Paul street around the Douglas Monument, replacing the present lights and putting up double iron poles; five additional lights are to be placed; plans are being considered for placing a double pair of lamps at the entrance to the New York Central station in Central avenue and extra lights around the Douglas Monument.

Troy, N. Y.—Alderman Greenwood, Chairman of the Lamps Committee, has reported favorably upon the placing of electric lights on Fifth avenue, between Jacob street and Bridge avenue, on Bridge avenue, between River street and Fifth avenue, and at the southwest corner of Jacob and King streets.

Spencer, N. C.—East Spencer will petition Legislature for authority to issue $25,000 light and water bonds.

Dickinson, N. D.—Hughes & Deiters are considering the enlarging of their electric lighting plant; an 80-foot addition will be erected and two new boilers installed.

Grand Forks, N. D.—The Commercial Club has decided to accept as a lighting system for the city that of side lights sim-

ilar to those used in Minneapolis; system adopted will mean eight lampposts in a block, four on each side of the street and four lights on each lamppost.

Cleveland, O.—Plans are being drawn for new power plant for the new Court House, to be erected on West Tenth street, corner of St. Clair avenue; complete outfit, including building and equipment, will cost about $150,000 to $200,000; plans are being prepared by the Cleveland Engineering Company, of which Harry Woodward is President.

Columbus, O.—The East Side Citizens Association is soliciting funds for the erection of a double light arch at Muller and Maine streets.

Columbus, O.—Superintendent Herman Gamper, of the Municipal Light Department, has recommended that another wire be run from the plant, south on Sandusky street to State, east on State to Grant, south on Grant to Main, where the arches in the Hub district can be lighted; if the plan of Superintendent Gamper is adopted the city will soon be lighting the workhouse, the City Hall, Carnegie Library, Public Library on Town street, and the city prison; besides these public places the arches on West Broad street, along High street, and those in the Hub district could be lighted from the same circuit; at an estimated cost of about $2,300 this complete circuit can be installed, as it is impossible for the municipal plant to light all the arches that are being proposed; the only way these proposed arches can be lighted at this time is for the city to make a contract with some public concern furnishing current; estimated cost of lighting 22 arches, the same as on High street at the present time, would only be about $3,000 a year.

Dayton, O.—The Chamber of Commerce is considering plans of John McGee for changing the lighting system in the central part of the city from overhead arc lights to lamps placed on poles; cost of posts, $61 each.

Ironton, O.—Citizens are urging the construction of arches across the main street and their illumination at night.

Newton Falls, O.—Council has awarded a franchise for 20 years to the Home Lighting Company.

Kiowa, Okla.—Citizens have voted to issue bonds for construction of a complete electric light plant.

McAlester, Okla.—Citizens have voted a gas franchise to L. C. Featherstone.

Oklahoma City, Okla.—The Oklahoma Gas and Electric Company will build 50 miles of gas mains; several miles of light circuit, and also install another 1,500-h.p. gas engine; cost, $500,000.—F. H. Tidnam, Manager.

Hood River, Ore.—Citizens will vote March 25 on $200,000 bonds for construction of light and water plant.

Roseburg, Ore.—J. L. and S. A. Kendall, owners of the local electric light plant, will double its capacity and extend the water mains and electric wires.—J. R. Lee, Superintendent.

Union, Ore.—There is reported to be a movement on foot here for a municipal electric light plant.

Chester, Pa.—The Southern Power Company will soon begin construction on Chester's new electric plant.—L. B. Sloop.

Philadelphia, Pa.—Chief McLaughlain, of the Electrical Bureau, is planning to secure the necessary current to operate the rather complicated machinery of the police telegraph system from that supplied the city for lighting purposes and thus do away with the necessity of generating this extra current in the city's large lighting plant; cost of change, $5,200.

Ringing Rocks, Pa.—The Metropolitan Electric Company, of Reading, will erect a sub-station; new plant and its sub-stations will cost $2,000,000.

Providence, R. I.—The Atlantic Mills has plans prepared for a power house; capacity will be 8,000 hp. and a steam turbine of 1,500 kw. has been contracted for; steam engines, now scattered over various sections of the plant, will be removed when the new power plant is ready.

Buffalo City, Tenn.—H. H. Buie will construct a dam across Buffalo River from which will be derived the power for an electric line that is to be built in that section; line is proposed to be constructed from Yellville to Rush, a distance of twelve miles.

Monterey, Tenn.—City is considering the establishment of a municipal electric light plant.

Logan, Utah.—Council has decided to purchase three new transformers for the municipal light plant.

Richmond, Va.—Chairman Richardson, of the Councilmanic Committee on Electricity, Alderman Whiting and Councilman Wiltshire have been appointed as a sub-committee to select an expert engineer to examine and verify the plans prepared by E. W. Trafford, Chamber of Commerce Bldg., for the proposed municipal electric light and power plant.

Aberdeen, Wash.—Property owners on Market and Webster streets will install a system of oramental electric lamps similar to ones now installed on Heron street.

Chehalis, Wash.—The Twin City Light and Traction Company has been incorporated to furnish light and power to Chehalis and Centralia; capital, $400,000.—A. Welch and W. J. Patterson, of Portland, and C. L. Mackenzie, of Colfax, incorporators.

Fairfield, Wash.—Town has granted an electric light franchise to the Nixon-Kimmel Company, of Fairfield.

Pasco, Wash.—An appropriation of water from the Columbia River has been filed here by the American Power Company; application calls for the use of 500 cubic feet per second, and the water is to be used on two townships of land.

Prosser, Wash.—The Prosser Falls Land & Power Company is considering the installation of an entire new generating plant; cost, $50,000.—John Chisholm, Superintendent.

Seattle, Wash.—Bids for $800,000 light extension and $1,000,000 park extension bonds will be received by the city early in March.

Spokane, Wash.—Denton M. Crowe has petitioned the County Commissioners for a franchise to build a pole line on the Jamieson and other roads on Moran Prairie and furnish light, heat and power and a telephone service; distance, 23 miles.

Tacoma, Wash.—Council is considering ordinances for the placing of Tungsten street lights at four corners.

Tacoma, Wash.—F. C. Kelsey, of Portland, has been formally elected by Council as Special Engineer to superintend the designing and construction of the $2,000,000 hydro-electric plant to be built on the upper Nesqually River.

Bridgeport, W. Va.—The Village will soon receive bids for lighting the streets; present contract will expire next November; George Koehnline has been appointed a committee of one to secure prices and bids; town is now paying $80 per light.

Parkersburg, W. Va.—The Parkersburg, Marietta & Interurban Railway will build a small power plant between Parkersburg and Marietta on the Ohio side of the Ohio River to take care of increasing business.

Wheeling, W. Va.—As soon as the legality of the $110,000 bond issue, lately voted, is determined, improvements will be made to the gas plant.

Wheeling, W. Va.—Superintendent Frank Thompson of the gas plant has recommended that larger mains be run to the Seventh and Eighth Wards; also that new retorts be placed at a cost of $27,000, with an additional $5,000 for alterations to the retort house.

Oconomowoc, Wis.—Council has decided to expend about $11,000 for electric light improvements.

Emard, Que., Can.—The St. Paul Electric Light and Power Company is considering the construction of a large extension to its plant.—F. Sevigny, Superintendent.

Toronto, Ont., Can.—City Electrical Engineer K. L. Aitken has completed plans for the city's power distribution plant; bids will be asked for underground cables within a month; the first installation will cost about $50,000.

BIDS RECEIVED AND CONTRACTS AWARDED

Moundridge, Kan.—The Matthews Construction Company was awarded contract, at $10,095.52, for constructing an electric light plant and a system of water works.—A. Ringwald, City Clerk; Burns & McDonnell, Engineers, 821 Scarritt Building, Kansas City, Mo.

Frankfort, Ky.—The Capitol Commissioners, January 23, awarded the contract for electric lighting fixtures for the entire building to Mitchell, Vance & Company, of New York; the price was $25,000 and the winning bidders offered more for that amount that any of the others; the electric light fixtures in the Wisconsin Capitol cost $125,000 and the Capitol Commission believes it has done as well for $25,000.

Falls City, Neb.—Contract for constructing an electric light system has been let to J. A. Bortenlanger.—W. H. Schmelzel, City Clerk.

Geneva, N. Y.—Edward Joy, Syracuse, has been awarded contract, at $2,500, for engine, generator, switchboard and cable wiring for the New York Agricultural Experiment Station.—Dr. W. H. Jordan, Director.

Rochester, N. Y.—The Rochester Railway and Light Company has entered into a contract with the Bausch & Lomb Optical Company, to supply its plant in St. Paul street with electrical power and light and also with its steam heat; this will necessitate the building of a plant on the river flats at Vincent street.

Lima, O.—It seems probable that the Ohio Electric Railway Company will secure the contract for arc lamps in the city and the building of the municipal plant will be abandoned; W. Kesley Schoepf, president of the traction syndicate, has submitted a revised proposition and offers to reduce the time limit on the contract he now holds of $85 per arc, which has two years yet to run, starting June 1, 1909 on a new contract at $57.50 per light; a generally reduced schedule for commercial lights is also embodied in the new contract offered, and Council, it is understood, will act favorably upon it, repealing the ordinance passed last fall, voting $80,000 for the municipal plant, on which already several thousand dollars has been expended.

Eugene, Ore.—Council has let the contract for the electrical apparatus for the proposed municipal power plant to the Portland Machinery Company, 62 First street, Portland, Ore., at $11,512. The terms of the contract call for machinery capable of generating 1,200 H.P. The contract for the turbine water wheel was awarded to the Pelton Water Wheel Company, at $19,800.

Ellwood City, Pa.—Councils have awarded the Pennsylvania Power Company the contract for furnishing electric light for street lamps and for the public buildings for a period of five years at 2 1-5 cents per kilowatt. The only other bid submitted was that of the Pittsburg, Harmony, Butler & New Castle Railway Company, which was 2¼ cents per kilowatt.

Weatherford, Tex. — Weatherford Gas, Light, Heat and Power Company awarded contract to United Gas Improvement Company, Philadelphia, Pa., for improvements to gas plant, including installation of standard set of water-gas apparatus; cost, about $30,000.

FIRE EQUIPMENT

Bisbee, Ariz.—Council will soon order work started on installation of fire alarm system.

Hartford, Conn.—The Fire Board has completed budget for this year; total amount is $259,920; of this amount $40,000 is wanted for new headquarters and $15,000 for a new storehouse; also $2,000 for two new automobiles.

Rockville, Conn.—Ellington citizens are urging better fire protection.

Palatka, Fla.—City will soon receive bids on 600 feet of fire hose.—Chairman Gay of City Council.

Macon, Ga.—The Finance Committee has recommended that $2,000 be appropriated for the preliminary work of putting fire alarm wires underground.

Port Byron, Ill.—Citizens are urging the need of better fire protection.

Anderson, Ind.—Fire Chief Alford has recommended the purchase of an engine, more modern ladders, truck and new hose; installation of alarm boxes at three corners and installing a storage battery.

Indianapolis, Ind.—The Board of Public Works is considering purchase at once of a site for a new fire engine house.

Indianapolis, Ind.—The Board of Public Safety will send an ordinance to Council asking an appropriation of $25,000 for an engine house at South and New Jersey streets.

South Bend, Ind.—Fire Chief Wilfred Grant has recommended the installation of automobile fire engines.

Leavenworth, Kan.—M. Bahler, Fire Chief and J. H. Johns, City Inspector, have made a list of buildings needing fire escapes and will demand the erection of same.

Lewisburg, Ky.—City will soon purchase equipment for a new fire station.

New Orleans, La.—City will erect a two-story engine house.—Chas. R. Kennedy, City Comptroller.

Beverly, Mass.—The Board of Aldermen has ordered $1,125 spent on hose for the Fire Department.

Lee, Mass.—Thos. Hayden, Chief Engineer, has procured plans from five different architects for a new fire house; cost, $15,000.

Marlborough, Mass.—City is considering purchase of 1,000 feet of hose, an individual tapper for the fire alarm system, two alarm boxes, section of wires on Main street, to be placed underground, 2½-inch rubber tires on two wagons, Seagrave ladders and a modern Seagrave truck.—Fire Chief Andrews.

Springfield, Mass.—The Fire Commissioners are considering the purchase of the St. Paul's Church property as a site for the new central station.

Sauk Rapids, Minn.—Citizens are soliciting funds for uniforms for the new volunteer department.

Virginia, Minn.—Fire Chief A. F. Thayer has recommended the putting in of a direct fire alarm on the school buildings and the purchase of 1,000 feet of hose.

Weston, Neb.—Citizens have organized a fire department.

Fairbury, Neb.—Town is considering purchase of a combined chemical and hose wagon, also minor equipment.

Montclair, N. J.—Town will erect a house for Hose Company No. 5.—Harry Trippett, Town Clerk.

Pitman, N. J.—The Pitman Fire Company No. 1 is soliciting funds for additional equipment; Company No. 1 will soon complete its fire house.

Rahway, N. J.—Council has granted the petition of sixty prominent citizens to organize a fire company in the eastern section of the city; also ordered a new set of city maps, at an expense not to exceed $1,200, and took under advisement the installing of six new fire alarm boxes.

New Hartford, N. Y.—City is considering the installation of some sort of a fire alarm system.

Staatsburg, N. Y.—Town is considering purchase of about 1,200 feet of hose.

Columbus, O.—Council has received a resolution directing the Board of Safety to have plans prepared for a new engine house in the vicinity of Cleveland street and Mt. Vernon avenue.

Hamilton, O.—Councilman Baur and the Board of Safety are considering the estimated cost of equipping the new engine houses in the Fifth and Sixth Wards; bonds will be issued.

Norwalk, O.—Chief R. W. Brown, of the Fire Department, has recommended the purchase of more hose and new and lighter ladders; also the installation of a fire alarm system by the American Magnetic Fire Alarm Company, of Ada; cost, $1,000.

Youngstown, O.—The Fire and Police Committee, Mayor, Solicitor and Fire Chief will meet to consider purchase of an automobile fire engine for the new South Side department.—Jas. A. Green, of the Fire and Police Committee.

Guthrie, Okla.—The taxpayers, 17 months ago, voted $10,000 for additional fire equipment, but none has yet been bought; a petition signed by practically every property owner in East Guthrie, asking for a fire station on Capital Hill is now before Council.

Portland, Ore.—Appropriations for the building and installing of three new fire engine houses and the construction of a fourth to replace one which is in a dilapidated condition, the purchase of several thousand feet of hose and 15 fire alarm boxes and their installation have been recommended by the Ways and Means Committee of the Council.

Chambersburg, Pa.—Council is considering a plan to make a central station and City Hall of the market house, maybe selling Junior fire house and placing the Juniors at the present market house, which would embrace the Friendship house and placing the Friendships in the east end of town with a chemical engine.

Everson, Pa.—Citizens are considering the formation and equipment of a fire department.

Pittsburg, Pa.—Architects Billquist & Lee have prepared plans for a 2½-story fire engine and patrol station; cost, $32,000.

Scottdale, Pa.—Fire Chief Dickerhoff has asked for 25 rubber hats and coats and one or more Anderson nozzles.

West Chester, Pa.—The West Chester fire company is considering the attaching of a gasoline motor to its chemical engine.

Williamsport, Pa.—Fire Committee is considering installation of the Gamewell fire alarm system.—Chairman Macmillan.

Cumberland, R. I.—Taxpayers are urging the installation of a combination hose and chemical wagon.

Woonsocket, R. I.—Fire Engineer A. J. Cote has recommended the erection of a new fire station; also the purchase of a new steamer.

Park City, Tenn.—The Fire Committee has received plans for the proposed $7,500 engine house.

Park City, Utah.—Citizens have organized a volunteer fire department.—George W. Morse, Chief.

Emporia, Va.—Town will purchase a light weight service hook and ladder truck with full complements of hooks and ladders, new or second-hand.—C. L. Broadwell, Superintendent Water Works.

Norfolk, Va.—Citizens in the Eighth Ward are urging better fire and police department buildings.

BIDS RECEIVED AND CONTRACTS AWARDED

Baltimore, Md.—Contract to erect No. 16 truck house on Calvert and Read streets has been awarded to Fredk. Decker & Sons, 1209 E. Biddle street, at $26,200.

Gloucester, Mass.—The Committee on Fire Department has been authorized to contract with the Gloucester Net & Twine Company, to furnish steam for the fire whistle for one year, beginning January 23, at $150 per annum.

Enid, Okla.—Council, January 21, awarded a contract to the Gamewell Fire Alarm Company, of Chicago, for the installation of a Gamewell alarm system to cost $20,000. Council also ordered a combination automobile fire engine and hose ladder to cost $6,500.

Philadelphia, Pa.—Bids were opened, January 26, to supply fire engines and trucks for the Department of Public Safety; there are requisitions filed with the Department of Supplies for two large fire engines, three of a second size, three hook and ladder trucks and seven chemical engines; the bidders are: La France Engine Company, of Elmira, N. Y., $5,782 for 900-gallon capacity engine, $5,107 for 500-gallon engine and $5,175 for 85-foot ladder truck; Combination Ladder Truck Company, of Providence, R. I., $5,175 for the ladder truck and $1,294 for the combination chemical engine and hose wagon. Local bidders are Robinson Fire Apparatus Manufacturing Company, which bid $1,332, and Joseph Boyd & Bro., $1,360, on the combination chemical engine. The American-La France Company has been awarded contract for the five fire engines and three ladder trucks, for $42,410.

ELECTRIC RAILWAYS

Sheffield, Ala.—The local Traction Company is considering a plan for the extension of its railway system to the Florence University in East Florence; distance, about two miles.

Yellville, Ark.—The Commercial Club of Yellville is urging the construction of a street railway from the city square to the depot; a committee consisting of W. E. Layton, S. W. Woods and A. W. Estes has been appointed to draft an ordinance to be presented to Council for passage.

San Francisco, Cal.—Application for a franchise has been made to the Board of Supervisors by Frank D. Stringham, an attorney, who seeks on behalf of Eastern capitalists permission to use Stockton street, from Market to the bay, for an electric roadway.

Santa Barbara, Cal.—City has granted a franchise to the Santa Barbara Consolidated Railroad Company for a street railway along Bath street.

Stockton, Cal.—Morris L. Brackett, of New York, has secured rights-of-way from Modesto to Riverbank for the San Joaquin Valley Electric Railway Company; part of the proposed road between Stockton and Modesto is almost ready for construction work.

Danbury, Conn.—D. E. Leowe has petitioned the State for a charter for an electric line to run from Danbury past Lake Kenosia to the New York State line.

Lebanon, Conn.—The Lebanon St. Railway Company will build a line from Yantic to South Manchester; distance of 28 miles. —L. E. Livermore, President; L. P. Smith, Secretary.

Meriden, Conn.—C. J. Danaher has asked for a charter for an electric railway from Meriden to Berlin; branch will be run to the Berlin station; also a charter for a line from Meriden through Kensington to a connection with the Berlin-New Britain line at Berlin Junction.

Wilmington, Del.—The Montana Rapid Transit Company has been incorporated to construct and operate electric railways; capital stock, $5,000,000.

Wallace, Ida.—The Slate Creek Electric Company will erect a $200,000 15,000-horsepower plant, to be operated by water power from Slate Creek; an electric line will be run in Wallace and interurban lines established between principal mining towns of the Coeur D'Alenes.—H. J. Rogers, Vice-president.

Belleville, Ill.—Council has adopted an ordinance granting the Belleville & Interurban Railway Company the right to operate a street railway on Illinois street.

Freeport, Ill.—The Freeport Interurban Railway Company has not yet awarded contracts for constructing their proposed line; distance, 36 miles.—O. T. Smith, President.

Naperville, Ill.—The Du Page Railroad will build an electric railway from Wheaton to Naperville and Plainfield; capital stock, $25,000.—Asa M. Royce, President; W. F. Keeney, Secretary and Treasurer.

Springfield, Ill.—J. W. Crowley has applied for a charter for the Tri-City & Northeastern Interurban Railway Company.

Des Moines, Ia.—The Des Moines, Winterset and Creston Electric Railway Company will soon begin work on the proposed electric road which is to extend from Des Moines to Winterset, Macksburg and Creston, Ia.; length, 60 miles.—W. D. Skinner, Des Moines, President; Milo Ward, Des Moines, Secretary; S. D. Alexander, Winterset, Treasurer; L. H. Hixson, Des Moines, General Manager; Iowa Loan and Trust Bldg., Des Moines, headquarters.

Cherokee, Kan.—Council has granted the Joplin & Pittsburg Electric Railway a franchise for the construction of its line into that town; franchise calls for the completion of the road from Weir Junction into Cherokee, a distance of five miles, inside of six months.

Parsons, Kan.—The Parsons electric light plant has been sold to the Parsons Street Railway and Electric Company for $90,000; electric company has a street railway franchise and will commence the construction of the street railway system at once and will spend about $50,000 on the rebuilding of the electric light plant; company is capitalized for $400,000 and has been organized by the election of Albert Emanuel, of Dayton, O., President; W. T. Neligh, of Parsons, Vice-president, and W. R. Sullivan, of Dayton, O., Secretary and Treasurer.

Topeka, Kan.—Citizens of Shawnee township in Johnson county, are considering with David Johnson, representative of the Kansas City & Olathe Electric Railroad, the improvement of the electric line's right-of-way and the construction of the line west of Shawnee; Township Board has decided to build a new trestle over Turkey Creek and to raise the grade of one-fourth of a mile of road leading to this trestle; cost will be $3,000; line will be continued to Lawrence instead of Olathe, as was first intended.

Louisville, Ky.—The Kentucky Central Traction Railroad Company has not yet let contracts for the construction of this 40-mile electric road, which is to connect West Point, Elizabethtown, Howard, Wine Grove and Hogdonville; capital, $500,000.—G. J. Lampton, President and General Manager.

Algiers, La.—The Algiers Railway and Lighting Company is considering numerous extensions.—R. S. Stearns, General Manager.

Boston, Mass.—As a solution of the congestion problem of transportation on Light street, City Councilman John Betz, Jr., of the Sixth Ward, has made a proposition to construct an overhead car line down that thoroughfare; sentiment as to laying surface tracks is evenly divided.

Newburyport, Mass.—The petition that has been in circulation for the building of an electric street railway to New Castle, in the hands of citizens in that town, and in Portsmouth, will be presented to President Tuttle of the Boston & Maine system by influential men from this city and New Castle who will present the facts why the road should be established to the seaside town.

Detroit, Mich.—Citizens will vote in April on the Breitmeyer street railway franchise.

Hibbing, Minn.—The Northern Traction Company is considering construction of a line from Hibbing to Chisholm and Buhl.

Virginia, Minn.—The Mesaba Rapid Transit Company is considering the connection of Virginia, Biwabik, Aurora and McKinley by an electric railway.

Hattiesburg, Miss. — The Hattiesburg Traction Company will let contracts in 15 days for the construction and equipment of the proposed street car system.—N. B. Blount, Secretary.

St. Louis, Mo.—City has granted an extension of time to the North St. Louis & Suburban Railway Company to begin work on its proposed line from the terminus of the North Broadway route of the United Railways of St. Louis via Jennings and Ferguson to Florissant.

Plattsmouth, Neb.—City wants an electric interurban line to connect with Omaha; for several years a line between Omaha and Plattsmouth has been under discussion, but no move looking to the building of the road has been made for some time until the Commercial Club at Plattsmouth decided the town wanted an electric line and wanted it this summer; a committee has been appointed to confer with G. W. Wattles, President of the Omaha & Council Bluffs Street Railway Company, to induce that company to build at Plattsmouth.

Elizabeth, N. J.—The Clinton Hill Cemetery Association will ask franchise to build a trolley line from Clinton Hill to Millburn.

Lakewood, N. J.—Lakewood and the coast towns may be connected by trolley before long; trolley road between Point Pleasant and this resort has been agitated in the past, but this proposed line will strike across the country at Sea Girt; Atlantic Coast Street Railway Company is back of the latest attempt to invade Lakewood, and business men here who favor a trolley are hopeful of its ultimate construction.

Millville, N. J.—The Carmel Farmers' Association has requested the Bridgeton & Millville Traction Company to run a spur from this city to the village of Carmel.

Elmira, N. Y.—The Wellsburg Board of Village Trustees and the Town Board of Ashland have granted the franchise which was applied for by the Elmira, Corning & Waverly Trolley Company, terms of which have been agreed upon.

Forestville, N. Y.—Town has received an application from the Buffalo & Lake Erie Traction Company for a franchise to build a street railway; company is formulating plans for the construction of an extension between Silver Creek and Forestville.

Hicksville, L. I., N. Y.—The Village Im-

provement Association is urging the construction of a cross-island trolley from Oyster Bay to Massapequa.—C. E. Fassbender, Secretary.

Hudson, N. Y.—The Albany & Hudson Railroad Company will purchase nine interurban cars; specifications can be had of R. H. Smith, General Manager.

Oneonta, N. Y.—The Oneonta, Charlotte Valley & Cobleskill R. R. Company has been unable to find financiers for its proposed line, which will connect Oneonta, South Worcester, Charlotteville, Summit, Richmondville, Cobleskill and other towns.—C. G. Payne, Charlotteville, N. Y., President and General Manager; F. W. Olmstead, South Worcester, Secretary.

Rochester, N. Y.—The Men's Civic Club has appointed a committee composed of Geo. Hiller, H. A. Rose, B. A. Northrup and L. A. Stillman to consider the most feasible railway routes to the new Carter Park, whether by streets, loop, or direct line.

Southport, N. Y.—The Town Board has decided to grant a franchise to the Elmira, Corning & Waverly Traction Company for the construction of a line through the town.

Syracuse, N. Y.—R. O. Smith, of the Transportation Committee of the East Side Improvement Association, has informed the association that the Syracuse Rapid Transit Railway Company would build a new line through Green and Robinson streets and Shuart avenue, at a cost of $160,000.

Goldsboro, N. C.—The State has issued a charter for the Goldsboro Traction Company for the construction and operation of a street-car system in and around Goldsboro to the limit of 50 miles in any direction out of the city; capital, $150,000.—A. T. Oliver, J. H. Trent, S. L. Blackburn and J. S. Oliver, Promoters.

Kenmore, O.—Council is discussing the revised franchise granting T. L. Childs, of Akron, right to run his Turkeyfoot Traction line over the Manchester road through the village; franchise has been given its first reading and will probably be passed.

Lima, O.—The Franchise Committee will confer with the Street Railway authorities with a view to having the service of the West Market street line extended beyond the corner of Cole street and Lakewood avenue.

Toledo, O.—The Ohio Northern & Michigan Railway Company will build the following lines: Toledo & Ann Arbor branch, to connect Lambertville, Mich., Petersburg, Dundee, Milan and Ann Arbor; extension from Petersburg northwest to Jackson via Britton, Ridgeway, Tecumseh, Brooklyn and the chain of lakes south of Jackson; company has working connections with the electric lines at Jackson, Ann Arbor and Toledo; company expects to build the section from Petersburg to Jackson as soon as the weather permits; a number of bridges are yet to be put in place; capital, $1,000,000.—W. E. Niles, Secretary, 122 Monroe street, Chicago, Ill.

Youngstown, O.—Council is considering a plan to open a through street from Rayen avenue to Front street and to have all Mahoning avenue cars now crossing over the dangerous Westlake grade crossing, including North avenue, Brier Hill, Gerard, Niles and Warren cars and the cars of the Lake Erie & Youngstown road, soon to be built, come down by the way of West Rayen avenue and the new street.

Wooster, O.—The Wooster & Mansfield Electric Railway Company is considering the construction of an electric road, 41½ miles in length, connecting Wooster, Shreve, Big Prairie, Lakeville, Londonville, Perrysville, Lucas and Mansfield; catenary construction will be used; capital, $30,000.—B. L. Chase, Mansfield, President; David Collier, of Plimpton, General Manager; D. M. Graven, Londonville, Secretary, and Chas. Brumfield, Mansfield, Treasurer.

Blooming Valley, Pa.—The Central Crawford Traction Company is considering plans for the construction of its proposed electric road this spring; line will connect Meadville and Titusville; length, 28 miles.—Dennis Smith, Guy Mills, Pa., President, and J. W. Heard, Blooming Valley, Secretary and Treasurer.

Lancaster, Pa.—A deal has just been completed whereby the through trolley connection between Lancaster and Philadelphia will be completed during the present year; the Susquehanna Rail, Light, Heat and Power Company, which controls the trolley and lighting systems of Lancaster, has purchased the property of the Philadelphia, Coatesville and Lancaster Street Railway Company from the bondholders; newly acquired line is about 11 miles in length, extending from Coatesville to Christiana; about five miles of it between Coatesville and Parkesburg is in operation, so that only six miles of the roadway is to be built; the exact route for the line between Parkesburg and Christiana has not been definitely determined.

Lansdowne, Pa.—The Sharon Hill and Upper Darby Street Railway Company has made application before the Borough Councils of Lansdowne and Alden for a franchise granting a double-track right-of-way from the Chester pike and Clifton avenue, Sharon Hill, through Sharon Hill, Collingdale, Alden, Lansdowne and the Township of Upper Darby to a terminus at Sixty-ninth street, Philadelphia.—J. A. Riggs, President.

Philadelphia, Pa.—Members of the Central Committee of Improvement Associations of Northeast Philadelphia have decided to continue the campaign for a trolley system to run on Bustleton pike between Frankford and Bustleton and for the proposed elevated railroad to Frankford.—Dr. C. J. Lewis, President; J. C. Tustin, Secretary.

Dallas, Tex.—Advices have been received from Galveston, headquarters of the officials of the Gulf, Colorado & Santa Fe, to the effect that it is still the plan to put motor cars in service between this city and Cleburne; no detailed announcement is made beyond the statement that it is proposed to have a one or two-hour service; exact date the motor car service is to be installed is not given.

Plainview, Hale County, Tex.—The Citizens' Committee for Plainview has accepted Southwestern Construction Company's offer to build two electric lines, one southwest, the other southeast from Plainview; bonus asked is $40,000, and the right-of-way seven miles southwest and to county line on southeast; work will begin within 30 days after the contract is signed.

Salt Lake City, Utah.—The Salt Lake & Ogden Railway Company will electrify its line between Salt Lake City and Ogden; distance, 50 miles; cost, $600,000.—S. Bamberger, President, and E. A. Vail, Chief Engineer.

Chehalis, Wash.—The Twin City Light and Traction Company has filed articles of incorporation; incorporators are A. Welch and W. J. Patterson, of Portland, and C. L. MacKenzie, of Colfax, and the capital stock of the company is placed at $400,000, divided into 4,000 shares of $100 each; purpose of the company is for building and operating an electric railroad between Chehalis and Centralia and furnishing light and power to the two cities.

Spokane, Wash.—City has received an application from the Spokane, Columbia & Western Railway Company for a franchise to enter the city.

Tacoma, Wash.—Attorneys for the Milwaukee Terminal Company have filed with the city their acceptance of the franchise granting the company the right to construct and operate its tracks along Front street between Old Town and the smelter; company is given two years to complete the construction of the line; one of the terms of the franchise provides that the railroad shall construct and maintain a 24-foot wagon roadway between Old Town and the smelter.

Racine, Wis.—The Milwaukee Electric Railway and Light Company is considering the construction of a line from Racine west, which will be built to tap the main line at Burlington.—J. I. Beggs, Manager.

Cobourg, Ont., Can.—The Cobourg, Port Hope & Havelock Electric Railway has made an application to the Ontario Legislature for a charter for this company to build a road connecting Port Hope and Cobourg, extending across the country to Warkworth and Campbellford, and on to Havelock; branch line will also be built from Cobourg to Gore's Landing.—G. H. A. Ward.

Mexico City, Mex.—The Tramways Company will at once electrify its Penon line which at present is being operated by mule cars.

BRIDGES

Phoenix, Ariz.—The Phoenix and South Side Bridge Company has submitted a plan for the building of a bridge across Salt River at the foot of Central avenue; cost, about $50,000.

Tucson, Ariz.—The Board of Supervisors has decided that the proposed bridge over the Santa Cruz River on the road to St. Mary's Hospital will be built at a cost of between $5,000 and $6,000, a portion of this amount to be borne by the county, approximately about one-half, while the property owners directly interested in the erection of the structure will bear the balance; County Surveyor Goetz will begin shortly to draw up plans for the structure.

Hartford, Conn.—Common Council will be asked by the Board of Public Works to issue bonds for improving the Walnut avenue and Ferry avenue bridges with concrete, creosote planking and wood block; City Engineer Robbins has estimated cost of Walnut avenue bridge at $8,430 and the Ferry avenue bridge at $6,200.

Indianapolis, Ind.—Mayor Bookwalter has asked the Board of Public Works to take steps for the construction of two new bridges. One of these, he suggested, should be placed across Pleasant Run at Emerson avenue and the other across the canal at Thirtieth street; Board ordered the City Engineer to order plans for the former and took the latter question under consideration.

Martinsville, Ind.—Morgan County Commissioners are asking for bids for constructing approaches to a number of bridges.

Hutchinson, Kan.—Citizens are urging the erection of a bridge across Poplar street; cost, $550.—City Engineer Elbury.

High Bridge, Ky.—The Cincinnati, New Orleans & Texas Pacific Railway is considering construction of reinforced concrete bridge to replace present structure at High Bridge; plans have been prepared for a steel arch structure; cost, $1,250,000.—H. E. Warrington, Chief Engineer, Cincinnati.

Bangor, Me.—In return for a 50-year extension of its street railway franchise the Bangor Railway Company has offered to build two steel spans in the Bangor-Brewer bridge and to put the piers and abutments in proper condition; also to transport free all gravel and other material used on the city streets.

Muskegon, Mich.—The Muskegon County Board will expend $32,000 in widening the North Muskegon bridge crossing the Muskegon River marsh.

Duluth, Minn.—Council has voted to ask for bids on both concrete and steel as material to replace the bridge on Superior street over Fischer's Creek.—City Engineer McGilvray.

St. Paul, Minn.—The Ramsey County delegation is considering the introduction of a bill in Council authorizing the issuing of bonds for the erection of bridges at Minnesota street and Summit avenue.

St. Louis, Mo.—Mayor Wells has approved of the appointment of Henry W. Hodge, 1 Nassau street, New York, as engineer for the Municipal Free Bridge to be constructed here at a cost of $3,500,000.

Central City, Neb.—Merrick County Commissioners and Polk County Commissioners are considering the construction of a bridge over the Platt River; cost, $12,000.

Boonton, N. J.—The Morris County Board of Freeholders has decided to expend about $8,000 for repairs to the iron bridge, 475 feet long, spanning the Rockaway River at Washington street.

Mineola, L. I., N. Y.—As soon as the Public Service Commission approves the plans a double-track railroad bridge will be constructed over the Long Island Railroad tracks; estimated cost, $100,000.—W. E. Sexton, Engineer, 46 North Twelfth street, Philadelphia.

Rochester, N. Y.—Citizens are urging the erection of a temporary bridge at Allen street while the new bridge is being built.

Schenectady, N. Y.—Geo. W. Kittredge, Chief Engineer, New York Central Lines, has completed plans for construction of large concrete culvert, at Villa road and N. Y. C. & H. R. R. R. tracks; bids will soon be received.

Syracuse, N. Y.—Plans are being prepared for a steel superstructure and concrete substructure for a bridge over Onondaga Creek, at Tallman street; estimated cost, $14,000; bids will be received soon by the Board of Contract and Supply.—H. C. Allen, City Engineer.

Elizabeth City, N. C.—The Camden Ferry Company will build sometime this year a bridge across the Pasquotant River.

Dayton, O.—The Servers will repair the flooring and walks of the West Fifth street bridge; bids for the reflooring will be asked for within a few days; contracts will be awarded separately, as the City Railway Company is under obligation to pay two-fifths of the cost of the roadway.

Dayton, O.—City Engineer Cellarius has estimated the construction of the canal lift bridge at Webster at $9,000; to girdle bridge across canal at South Ludlow, $4,500.

Youngstown, O.—Council is considering a plan whereby a bridge is constructed over the Erie tracks at Federal street and a through street opened from Rayen avenue to Front street.

Scranton, Pa.—Mayor Dimmick is pushing plan for erection of a long viaduct at Mulberry street; expense will be divided among the Delaware and Hudson Company, the Ontario and Western Company and the city.

Wilkes-Barre, Pa.—Luzerne and York County citizens are considering the construction of a bridge over the river, connecting Hanover and Plymouth; cost about $175,000.

Richmond, Va.—Company is being formed to construct bridge on site of present Mayo's bridge, connecting Richmond and Manchester; structure will be of reinforced steel concreete and cost about $150,000;

George C. Gregory and A. R. Mayo are interested.

Spokane, Wash.—City Engineer J. C. Ralston has estimated the cost of constructing a steel viaduct at Washington street at $350,000.

Tacoma, Wash.—All the plans, specifications and estimates for the new bridges that are to be built by the city this summer, provided the people vote a bond issue of $300,000, have been completed by Engineer J. W. Betchol, of City Engineer Frank L. Davis' staff; plans and estimates have been made for five concrete bridges; these are to replace old ones worn out and which must be replaced before they become dangerous; most expensive bridge is the one planned to span the gulch on South Yakima avenue; estimated cost, $99,624; largest bridge in the quintet is one to be built on Puyallup avenue, between A and East C streets; estimated cost is $90,582; bridge to be built on North Twenty-third street will cost $87,000; on North Twenty-first street, between Fife and Anderson, $59,000, and one on Tacoma avenue, the plans for which were drawn a year ago, $75,000; Tacoma Railway and Power Company will have to pay approximately $100,000 toward the cost of the bridges, the total expenditure for which will be $412,000.

Wheeling, W. Va.—Preliminary plans have been prepared by City Engineer Cooke for the proposed new Market street bridge.

Milwaukee, Wis.—The U. S. Government has approved the plans of City Engineer Chas. J. Poetsch for a new bridge at Michigan street; approximated cost, $120,000.

St. Boniface, Man., Can.—The St. Boniface Council has agreed to proceed with its share of cost toward the construction of the Central bridge of the Transcontinental Railroad; total cost, about $278,000. —H. D. Lumsden, Chief Engineer Transcontinental Railroad; M. P. Blair, City Engineer.

BIDS RECEIVED AND CONTRACTS AWARDED

San Bernardino, Cal.—Contract for bridge over Warm Creek at East Third street has been let to the McIntyre Cement Company, of Riverside, the low bidder, for $4,-846.80; also for five concrete culverts over Town Creek in Fifth, Sixth, C, Ninth and Tenth streets, and removing wooden bridges, to the McIntyre Cement Company for $6,224.87.

Chicago, Ill.—Bids were received as follows, January 20, by the Sanitary District of Chicago, for the superstructures of the Chicago & Northwestern Ry. Co.; (a) a railroad bridge for the Mayfair cut-off of the railway in Niles Township, (b) a railroad bridge for the Milwaukee division at Grant street, Evanston, Ill.: George W. Jackson, Inc., Borland Building, Chicago, (a) $21,851, (b) $10,464; the Toledo-Massilion Bridge Company, Toledo, Ohio, (a) $22,100, (b) $11,730; Fort Pitt Bridge Company, House Building, Pittsburg, Pa., (a) $23,309, (b) $12,511; Milwaukee Bridge Company, Milwaukee, Wis., (a) $24,110, (b) $11,850; Modern Steel Structural Co., Waukesha, Wis., (a) $25,207, (b) $11,587; Wisconsin Bridge & Iron Company, Monadnock Building, Chicago, (a) $24,900, (b) $12,500; Charles Volkmann & Company, 184 Dearborn street, Chicago, (a) $24,725, (b) $13,-300; Penn Bridge Company, Beaver Falls, Pa., (a) $24,800, (b) $13,430; Worden-Allen Co., 184 La Salle street, Chicago, (a) $25,-442, (b) $13,525; Stroebel Steel Construction Company, Monadnock Building, Chicago, (a) $26,684, (b) $13,494; King Bridge Company, Cleveland, Ohio, (a) $27,100, (b) $13,-300; National Construction Company, Tacoma Building, Chicago, (a) $26,228, (b) $14,-592.—I. J. Bryan, Clerk, Sanitary District.

Hyde Park, Mass.—Contract for the construction of a reinforced concrete arch bridge was, on January 27, awarded to the Bryne Contracting Company, of Boston; it will have two spans of 45 feet 6 inches each and be 52 feet wide.—Clarence G. Norris, Town Engineer.

Joplin, Mo.—Council, January 19, awarded the contract for the construction of the Third street viaduct to Henry L. Doherty & Co., at about $40,000.

Columbus, O.—Because of irregularities in the bid of the Champion Iron Company, of Kenton, which was $64 lower, the Board of Public Service, January 20, awarded the contract for the construction of the superstructure of the Mound street viaduct to the McClintic-Marshall Constructions Company, Park Building, Pittsburg, at $18,576.

Seattle, Wash.—To the Puget Sound Bridge and Dredging Company, of Seattle, the North Coast Railway has awarded contract for the construction of a steel and masonry bridge crossing the Columbia River a short distance below Kennewick at a cost of upwards of $1,000,000.

MISCELLANEOUS

Oakland, Cal.—City is again discussing the plan to submit a bond issue for a new municipal building together with the issue for other improvements.

Redlands, Cal.—T. T. Smith, Secretary of the Tree Commission, has reported that the Commission has taken up the question of improving Alvarado street where recently opened, and that the Commission recommended the planting of acacia trees; because of the damage to trees, it was recommended that the light and telephone poles be placed in the alleys and wires run underground to the street for light.

Sacramento, Cal.—City Trustees have directed the City Engineer to prepare plans for improving the levee from N to S street.

San Diego, Cal.—Plans and specifications have been completed for a reinforced concrete conduit to be constructed at Fifteenth street and Newton avenue; cost, $203,000.

San Francisco, Cal.—The State Board of Harbor Commissioners have advertised for bids for the construction of the new pier which has been assigned to the Western Pacific; plans for the new wharf have been approved by the Board and construction will proceed as soon as the bids are in; structure will cost $160,000.

San Jose, Cal.—Council has given first reading to an ordinance giving notice of and providing for holding a special election to permit the voters of San José to decide the question of the issuance of bonds for the purpose of acquiring and installing a garbage incinerator; Clerk has been instructed to proceed with the necessary arrangements.

New Canaan, Conn.—Architect Edgar A. Josselyn, New York City, is preparing plans for a two-story $30,000 Town Hall.

New Haven, Conn.—The Board of Finance will ask the Legislature for authority to issue new bonds for permanent improvements; principal objects which are likely to be asked for are the incinerator, which will go on the new Water street site purchased last week by the city; a new school house and fire escapes for those schools which require them, and bulkheads for Quinnipiac and Waterside parks; total cost, about $400,000.

Washington, D. C.—An American consul in a European country reports that the municipal authorities in the city in which he is located have applied for permission to float a loan of $3,257,375 to be used in certain municipal improvements, including water works, electric tramway, school buildings, hospitals, library, police stations, abattoir and other buildings. The consul states that the authorities are anxious to interest American capital in the enterprise and are willing to employ as far as possible American labor and material in the undertaking. Address No. 2998, Bureau of Manufactures.

Jacksonville, Fla.—Council has received a resolution authorizing the Board of Public Works to erect a crematory on the site of the electric and water plant.

Macon, Ga.—The Committee on Lights has requested an appropriation of $5,000 to place underground some of the wires leading from City Hall to the fire and police alarm boxes.

Evansville, Ind.—As a result of additional money appropriated by Common Council, the Board of Park Commissioners now have a sufficient fund to purchase the E. Q. Smith property on Riverside avenue to be converted into Sunset Park.

Terre Haute, Ind.—Members of the Board of Public Works, Board of Health, Mayor Lyons and Councilman Cowan are considering plans in regard to the erection of a crematory plant during the coming summer.

Dayton, Ia.—Council has authorized the preparation of plans for a City Hall, fire house and jail.

Oelwein, Ia.—Council is considering plans for erection of a City Hall.

Leavenworth, Kan.—The City Engineer has been instructed to furnish estimates on the cost of rebuilding the retaining wall on Broadway and Santa Fe viaduct; estimated cost, $1,500.

Pratt, Kans.—Architects Geo. P. Washburn & Son, 222 S. Main street, Ottawa, Kans., are preparing plans for a $75,000 three-story County Jail.

Covington, Ky.—City is discussing question of constructing a garbage crematory. —H. G. Meiners, City Engineer.

Lexington, Ky.—The Civic League has asked that Mayor Skain recommend the purchase and location at street corners and other public places of street refuse cans, the same as are used in other cities.

Boston, Mass.—An act for a Washington street subway between Castle and Dudley streets is asked for by a Committee acting for the property owners and abutters along the line of the present elevated structure on Washington street; bill provides that the city of Boston be authorized to build this subway, and that the franchise of the "L" be so modified that the elevated tracks will be abandoned and that train traffic along that thoroughfare be confined to the underground route; it is proposed that the subway shall provide double trackage each way for both local and express trains.

Cambridge, Mass.—The Board of Aldermen is considering an ordinance providing a $50,000 appropriation for the erection of contagious disease hospitals.

Chelsea, Mass.—City has awarded $500,-000 bonds to N. W. Harris & Co., of Boston; money will be expended on erection of new City Hall and other structures.

Gloucester, Mass.—At a special meeting of the Municipal Council it was ordered that the Committee on Public Property be authorized to contract for the removal of ashes, paper and rubbish from the several school buildings and grounds.

Gloucester, Mass.—City has awarded a $125,000 temporary loan to the Cape Ann National Bank.

Salem, Mass.—City will provide two playgrounds for children this coming summer; Peabody may also establish a playground.

Kalamazoo, Mich.—Council is considering an addition to the water works park.

Hannibal, Mo.—Plans and specifications will be ready in 15 days for new City Hall, for which $75,000 bonds have been voted.—A. S. Scheineman, City Clerk.

Independence, Mo.—City is considering the erection of City Hall, to cost about $15,000, instead of the proposed small brick jail, for which H. H. Pendleton, City Engineer, has been preparing plans; if jail only is built, construction will be by day labor and cost about $600.

Kansas City, Mo.—Dr. J. Park Neal has recommended that an ambulance service be established at the Municipal Hospital.

St. Louis, Mo.—Architect Jas. A. Smith has prepared plans for a three-story $50,-000 police station.

St. Louis, Mo.—Architect A. B. Groves has submitted plans for proposed City Hospital; estimated cost, $900,000.—A. J. O'Reilly, President Board of Public Improvements.

Manchester, N. H.—The Street and Park Commissioners are considering the construction of a crematory for ashes, refuse and garbage.—S. J. Lord, City Engineer.

Asbury Park, N. J.—As soon as preliminary plans are prepared and estimates of cost obtained, Asbury Park will take steps to construct a Convention Hall in the city with a seating capacity for 15,000 persons; action has been taken by Council and a committee appointed to consult architects and report at an early date; structure will occupy an entire square and will be of concrete material; it will contain music hall, convention rooms, sun parlors and a roof garden will be made one of the features; building will cost upward of $100,000.

Rahway, N. J.—Council has ordered a new set of city maps at an expense not to exceed $1,200.

Bay Shore, L. I., N. Y.—The Fire Island State Park Commission will file a plan for the improvement of the park, which will involve an expenditure of $348,100; improvements planned are very elaborate and include a centrally placed covered path from bay to ocean, transverse promenades, side and radiatory paths, an immense pier and seawall on the bay side, the sodding of the grounds and the conversion of the beach into a veritable seaside park; estimated cost of a few of the items are as follows: Restaurant, $40,000; bay side promenade, ocean boardwalk, paths, etc., $42,000; retaining wall, $29,000; dock, $7,000; bathing pavilion, bay side, $17,000; one on ocean front, $28,000; children's shelter, $12,000; recreation building, $23,000; filling in and grading, $30,000; covered walk, $12,000.

Poughkeepsie, N. Y.—City Chamberlain Edward Burgess will receive competitive designs April 1 for a memorial gate at College Hill, the cost of which shall not exceed $10,000; one submitting successful design to furnish detailed drawings and superintend the construction of the same and be compensated at the rate of 5 per cent. of the total cost.

Rochester, N. Y.—A committee from the Eighteenth Ward Civic Club will ask that the city purchase the triangle at Melville and Webster avenues for park purposes.

Rochester, N. Y.—Council has received an ordinance for the numbering of houses in Avondale Park, Middlesex avenue, Winter street, Gorsline street, Monroe avenue, Robin street, Rohr street, Ulm street, West Magnolia street, Lois street and Mayberry street.

Rochester, N. Y.—Mayor Edgerton has recommended the enlargement of Convention Hall, at a cost of $100,000.

Savannah, N. Y.—Citizens will vote on $6,000 bond issue to erect a Village Hall.

Seneca Falls, N. Y.—The Board of Trus-

tees will sell a $23,000 issue of village bonds on February 10.—J. M. Guion, Village Clerk.

Utica, N. Y.—Common Council President F. J. Baker and City Engineer Arthur O'Brien have returned from a trip to Albany, where they secured data concerning the erection of public baths.

Akron, O.—The Board of Public Service has instructed City Engineer Payne to prepare an estimate of the cost of placing new signs at all street corners in the city.

Cincinnati, O.—Council has passed an ordinance transmitted by the Board of Public Service, authorizing the purchase, at a cost of not to exceed $1,500, or an automobile for the use of the Superintendent of the Repair Department of Streets and Sewers.

Columbus, O.—The Board of Public Service will spend $500 in fitting up an office room for the City Sealer of Weights and Measures.

Dayton, O.—Health Officer Goodhue has recommended the establishment of a municipal abattoir; cost, $100,000.

Hamilton, O.—Engineer Jno. W. Hill, of Cincinnati, will send a report to the Citizens Committee covering the approximate cost of constructing a levee north of Hamilton and south of Hamilton to protect the threatened parts of the city; when report is received committee will report to Council and plans for the building of the proposed levees and the employment of an engineer for the work will be drawn.

Lorain, O.—Several propositions have been made to the Board of Public Service for taking care of the refuse of the city, the best proposition being one from a Cleveland engineer who comes forward with a plan for the erection of a disposal plant half way between Lorain and Elyria for the purpose of taking care of the garbage from both cities; cost, $25,000.

Toledo, O.—The Auburndale Citizens' Welfare Association is in favor of straightening Albion street and building a subway under the railway tracks on Post street; estimates of the cost of the improvement have been asked for; improvement, giving the people an outlet to Auburndale and across to Central avenue, is regarded as very much needed, and the total cost will be about $40,000.

Wynnewood, O.—Council has instructed Mayor T. P. Rollow to issue a call for a $15,000 bond election, half the money to be used for the erection of a City Hall and Fire Department headquarters and the other $7,500 for moving the water works and electric light plant nearer town and maybe erect a standpipe.

El Reno, Okla.—Commercial interests, backed by the Commercial Club, have decided to ask the city to vote on the proposition of issuing $200,000 bonds for the purchase of grounds and construction of buildings for a fair grounds.

McAlester, Okla.—City has voted $8,000 bonds for the construction of a City Hall.

McAlester, Okla.—City has voted to issue $203,000 worth of bonds for public improvements.

Oklahoma City, Okla.—Mayor H. M. Scales has announced that the city could legally issue $400,000 bonds for the proposed park and boulevard system.

Portland, Ore.—Councilman W. W. Wallace has recommended the establishment of a harbor patrol in connection with the Police Department.

Altoona, Pa.—The Highways Department will ask Councils for an appropriation of $15,000 for the purpose of street cleaning this year, an increase of $13,000 over last year's appropriation; besides the increased appropriation the Department will ask for some additional paraphernalia along the lines of recommendations made by Mayor Hoyer; recommendations include a sanitary automatic street flushing machine and two hand-sweepers for use on Eleventh avenue.

Pittsburg, Pa.—Architect J. P. Brennan and Architect Geo. H. Schwan are preparing plans for comfort stations to be erected for the Department of Charities and Correction.

Wilkes-Barre, Pa.—City Councils will be called upon to expend at least $50,000 for the work of the Park Commission during the ensuing year; among the projects which will entail considerable expenditure is the payment of the riprapping work done on the river common, the extension of the ball and play grounds and the opening of Suburban Park.

Providence, R. I.—The Metropolitan Park Commission has authorized its Executive Committee to carry out the recommendations of the landscape experts regarding desirable additions to the park system, in so far as the finances at the command of the organization permit.

Charleston, S. C.—City is considering plans for the construction of a sea wall, 4,000 feet in length, from White Point Garden around Chisholm's Mill property.

Arlington, Tex.—Council has granted Dr. J. D. Collins and associates franchise for use of mineral water, from the city's artesian well located on the public square; it is contemplated to erect a modern sanitarium, bathhouse and an up-to-date bottling plant; work shall begin within 30 days and be completed within two years.

Beaumont, Tex.—Plans and specifications are being prepared by City Engineer C. L. Scherer for a city wharf; cost about $50,000.

Galveston, Tex.—A movement has been started to interest the Board of City Commissioners in the proposition of providing a police patrol boat for the port.

Salt Lake City, Utah.—Roderick McKenzie has applied to Council for a 99-year lease on the Warm Springs in the northern part of the city; a large sanitarium will be erected.

Portsmouth, Va.—City is considering purchase of a police patrol wagon; resolution is in the hands of the Police Committee.

Seattle, Wash.—Municipal collection of garbage is being discussed by City Engineer R. H. Thomson, Health Commissioner J. E. Crichton and Superintendent of Streets M. T. Maloney, and while no definite plan has been adopted, it is likely that the Council will be asked to make an appropriation of $65,000 available for this purpose.

Seattle, Wash.—Bids for $1,000,000 in park extension bonds and $800,000 in light extension bonds will be received early in March.

Milwaukee, Wis.—The competitive plans of Architects Brust & Phillipp, 401 Camp Building, have been accepted for the new juvenile court and detention home building; cost, $75,000.

Milwaukee, Wis.—Plans have been completed for garbage incinerator, and bids will be received about Feb. 15 for constructing same.—Hering & Fuller, 170 Broadway, New York, N. Y., Engineers; Charles J. Poesch, Chairman Board of Public Works.

Viroqua, Wis.—Architect A. E. Small, Madison, Wis., is preparing plans for a two-story jail; cost, $20,000.

Vancouver, B. C., Can.—Citizens have decided to construct a garbage crematory; cost of site and plant, $75,000.—W. A. Clement, City Engineer.

Vancouver, B. C., Can.—The Great Northern Railway Company will soon submit plans to Council for its proposed terminals; cost, $3,000,000.

BIDS RECEIVED AND CONTRACTS AWARDED

Pasadena, Cal.—J. W. Ritzman and A. F. Charles submitted bids for street sprinkling. Ritzman was ½ a cent higher on day work per hour, bidding 38½ and Charles was a cent higher on night work, bidding 43 cents. Although Ritzman, apparently, had the low bid, Councilman Crandall moved that the contract be given to Charles; Hotaling thought the Charles bid lower owing to the preponderance of day work. The bids were referred to Superintendent of Streets Beyer; Charles declared that if he got the contract he would buy out his past partner, Post, and asked special consideration.

San Francisco, Cal—Thomas Thompson, city, has been awarded the contract, at $3,178, for repairing wharf at the Presidio.

Hartford, Conn.—The Finance Committee of the School Board has decided to award the contract for fire escapes for the school buildings to the Berlin Construction Company for $2,900; bids were received from six companies, and while the Berlin Construction Company's bid was not actually the lowest, it was considered the most reasonable, when it came to meeting the requirements. The style of fire escapes selected for the grammar school is with short rounds and frequent landings.

Baltimore, Md.—Street Cleaning Commissioner J. L. Wickes recommended that the contract for 15 new garbage carts be awarded to Francis T. Lynch, the lowest bidder, but it was contended by a representative of the Leonhardt Wagon Manufacturing Company that his firm had a patent on the carts and that Mr. Lynch could not make them; this allegation was denied by Mr. Lynch, but it was decided to refer the question to City Solicitor Poe before any action was taken.

The contract for erecting an addition to the stable of the Street Cleaning Department at Pratt street and Central avenue has been awarded to P. J. Cusher & Co., at its bid of $2,674.

The Armstrong Stone Company has secured the contract to install a new boiler in Walters Bath No. 2, at $1,500.

Boston, Mass.—Bids for disposition of garbage received January 20, given in January 27 issue, have been rejected.—Guy C. Emerson, Superintendent of Streets.

Gloucester, Mass.—Council considered the bids for removal of ashes from various public buildings and awarded the contract to James DeWinter at $249; other bids were as follows: Arthur G. Wanhoff, $339; F. W. Stanwood, $274; W. H. Reed, $273; William Center, $228.

Springfield, Mass.—The contract for the new City Library building has been awarded to Messrs. J. E. & A. L. Pennock, 1133 Broadway, New York, N. Y., and Land Title and Trust Company Bldg., Philadelphia, Pa.; the estimated cost of the building will be in the neighborhood of $240,000, which, with the cost of equipment, furniture, etc., will make a total of about $325,000.—H. T. Wellman, Librarian.

Kansas City, Mo.—The Board of Public Works, Robert W. Goodnow, Secretary, has awarded general contract for erection of comfort station to Carl A. Nilson, city, at $6,764, and to Cotter-McDonnell Plumbing and Heating Company, city, for plumbing, at $4,461; two tablets of bas-reliefs will be placed on two sides of base, other two sides to be occupied by drinking fountains; these ornamentations will cost about $3,500 additional; George R. Barse, Jr., received authority from Board for Chirstian Dryer, of Kansas City Fine Arts Institute, to make designs; Walter P. Birmingham, First National Bank Bldg., prepared plans for entire structure; fund appropriated is $15,000.

Laurel, Mont.—General contract for jail building has been let to O. M. Solso.—R. D. Noe, Architect.

Albany, N. Y.—All bids opened on December 22 by F. C. Stevens, Superintendent of Public Works, for improving New York State canals, Contract No. 20, Erie Canal, Sections 2, 3 and 4, have again been rejected; this contract calls for dredging a channel in Mohawk River and performing work incidental thereto between Rexford Flats and Little Falls; length, 58.7 miles; Engineer's estimate, $4,173,900.

Troy, N. Y.—A partial report was made January 26 by Commissioner of Public Works Shields in the matter of the selection of garbage collectors. All of the contracts were not awarded, and it was stated by the Commissioner that the men would be engaged for a term of a month at a time. This would insure more efficient and prompt service, and will give the city officials more latitude in dismissing a contractor not performing the work satisfactorily. Commissioner Shields also reported that he had decided that the present city district plan was the most feasible, and no change will be made. In the contracts just approved William J. Harper, representing the Troy Refuse Company, received no award. The following contracts were entered into: District No. 4, Charles R. Painton, $150; No. 5, Patrick E. Hooley, $110; No. 6, Owen Lynch, $110; No. 10, LeGrand Whyland, $115; No. 11, Jacob Lettrick, $110; No. 12, Peter Van Dusen, $125; No. 14, John McManus, $115; No. 18, Patrick J. Dore, $110; No. 19, John Stapleton, $120; No. 21, John Z. Becker, $140; No. 23, George Mack, $115; No. 24, Bernard Carroll, $110.

Toledo, O.—R. Bentley & Sons, 37 N. Huron street, have secured contract to build concrete dry dock for the Toledo Shipbuilding Company, for about $200,000.

Philadelphia, Pa.—The following bids were opened January 25 for repairs to Chestnut street pier: American Paving and Construction Company, $27,850; Philadelphia Construction Company, $27,900; W. S. P. Shields, $31,500; Franklin Eyre & Son, $36,795; Armstrong & Latta Company, $44,448; Henhoeffer & Vaughan, $48,900; Jas. Doak & Co., $48,982.—John C. Grady, Director, Department Wharves and Ferries.

Dallas, Tex.—Bids on furnishing new motor cycles for use in the Police Department were opened and referred to Commissioner Seay. H. Johnson bid $370.80 for two machines, J. W. Ruff offered one make at $190, one at $210, one at $250, one at $230, and one at $300; Charles Ott offered one class at $150 each and another at $210 each; the Aurora Auto Machine Company offered one class at $120 each and another at $180 each. A letter and bid from W. C. Terrell offered to sell the city one practically new $250 machine for $150. Upon recommendation of Commissioner Doran the contract for the plumbing work in the City Hall has been awarded to P. J. Sheehan & Co.; their bid for the work was $1,675, with a reduction of $75 for the old material not used, making the net bid $1,600.

Mineral Wells, Tex.—Guy Croft and Goodwin & Murphy have the entire contract for constructing a 2-story and basement concrete brick and iron bath-house.—R. H. Parry, Architect.

Seattle, Wash.—The County Commissioners, January 19, awarded contracts for repairing docks on Vashon Island that have recently been damaged by high wind and seas. J. M. Bruce & Co. received the contract for repairing the Vashon and Portage dock for $1,834; and the Cross, Cove, Colvos and Lisabula docks for $1,923.07; and C. Geske Co., Quartermaster and Burton docks for $3,197.

LOWEST BIDS RECEIVED FOR WATER WORKS SUPPLIES

Furnishing Cast-Iron Pipe

City	Amount, Tons	Diameter	Price	Specials, Price per Ton
New Haven, Mo.	98	4″	$26.30	.....
" " "	15	6″	25.80	.....
" " "	12	8″	25.80	.....
Portland, Ore.	400	6″	31.25	.....
" "	600	8″	30.25	.....
Wallingford, Conn.	68	8″	24.25	.....
" "	83	10″	24.25	.....
Cherokee, Ia.	20	4″	27.50	.....
Pensacola, Fla.	45	16″	20.40	.....
" "	142	12″	20.40	.....
" "	660	10″	21.35	.....
Trenton, Ill.	9	8″	.....	.....
" "	60	6″	.....	.....
" "	53	4″	24.75	.....
Prince Albert, Sask.	185	6″–8″	48.40	.....
Portland, Ore.	1,050	6″–8″	31.10	.....
Goderich, Ont.	16	18″	43.00	.....
" "	4½	18″	.....	$85.00
Holyoke, Mass.	170	20″	24.20	.....
Hollydaysburg, Pa.	186	4″	28.40	.....
Newark, N. J.	629	4″–8″	23.65	.....
" " "	327.25	10″–16″	23.20	.....
" " "	24.35	20″–24″	23.20	.....
Winnipeg, Man.	1,140	6″	41.00	.....
" "	161	8″	41.00	.....
" "	161	10′	41.00	.....
" "	214	14″	41.00	.....
" "	70	.....	.....	58.00
Minneapolis, Minn.	3,100	6″–24″	25.20	.....
Springfield, Mass.	19,000	....	23.90	.....
" "	100	....	.....	50.00
Ponca City, Okla.	....	4″	27.25	.....
" " "	....	6″	26.75	.....
" " "	4	.....	.....	63.00
Grand Rapids, Mich.	2	4″ A	23.45	.....
" " "	50	6″ B, A	23.45	.....
" " "	150	6″ B	23.45	.....
" " "	50	8″ B	23.45	.....
" " "	20	10″ A	23.45	.....
" " "	300	10″ B	23.45	.....
" " "	100	12″ B	23.45	.....
" " "	100	16″ A, B	23.45	.....
" " "	25	....	.....	48.00
Almena, Kan.	47	4″	34.00	.....
" "	100	6″	33.00	.....
Findlay, O.	74	6″	22.55	.....
" "	20	4″	23.55	.....
Greenville, Tex.	470	6″	29.30	.....
" "	65	8″	29.30	.....
" " "	75	16″	27.80	.....
Pittsburg, Pa.	....	4″	25.25	.....
" "	....	6″–8″	24.75	.....
" "	....	10″–66″	24.25	.....
New Ulm, Minn.	251	10″–14″	41.20	.....

Furnishing and Laying Water Mains

City	Length	Diameter	Trench Depth	Price
Reading, O.	3,000	4″	4′	$ .49
Albert Lea, Minn.	2,700	6″	7′	.828
Bryan, O.	7,000	4″	4′–6″	.445
Mont Alto, Pa.	5,100	6″	4′–6″	.75
" "	3,100	4″	10′	.60
Salt Lake, Utah.	100	4″	....	.81
" " "	20,000	6″	....	.93
" " "	1,000	8″	....	1.44
" " "	100	10″	....	1.98
" " "	100	12″	....	2.57
Herington, Kan.	.....	4″	....	.65
" "	.....	10″	....	1.46
" "	.....	8″	....	1.14
Reading, Pa.	428	30″	....	1.45
" "	64	10″	....	.80

Laying Water Mains (Including Trenching)

City	Length	Diameter	Trench Depth	Price
New Haven, Mo.	9,000	4″	3′	$0.14
" " "	900	6″	3′ 2″	.17
" " "	600	8″	3′ 4″	.20
Wallingford, Conn.	2,520	10″	4′	.174
" "	4,200	8″	4′	.164
Cherokee, Ia.	1,900	4″	6′	.24
Two Rivers, Mich.	1,070	4″	6′–8′	.275
Trenton, Ill.	390	8″	40″	.20
" "	3,680	6″	38″	.17
" "	4,850	4″	36″	.15
Prince Albert, Sask.	3,633	8″	9′–15′	.80
" " "	839	6″	9′–15′	.75
Toronto, Ont.	.....	12″	5′ 6″	.51
" "	.....	8″	5′ 6″	.40
" "	.....	6″	5′ 6″	.32
" "	.....	4″	5′ 6″	.28
" "	.....	3″	5′ 6″	.23
Ponca City, Okla.	2,650	6″	....	.165
" " "	20,000	4″	....	.15
Almena, Kan.	4,292	4″	....	.19
" "	6,099	6″	....	.22

Furnishing Gate Valves

City	Number	Size	Pressure, Lbs.	Price
Reading, O.	6	4″	....	$11.00
" "	1	6″	....	16.50
" "	1	8″	....	22.00
New Haven, Mo.	5	4″	100	7.75
" " "	1	6″	100	11.25
" " "	1	8″	100	15.75
Portland, Ore.	20	4″	300	7.21
" "	100	6″	300	11.85
" "	60	8″	300	17.95
" "	5	10″	300	25.42
" "	20	12″	300	32.85
" "	2	16″	300	110.00
Pensacola, Fla.	1	6″	300	62.00
" "	6	12″	300	31.25
" "	17	10″	300	22.50
" "	26	6″	300	7.50
Trenton, Ill.	6	8″	300	18.00
" "	5	6″	300	9.50
" "	8	4″	300	6.00
Prince Albert, Sask.	4	8″	....	20.00
" " "	21	6″	....	11.50
Bryan, O.	8	4″	150	8.00
Toronto, Ont.	..	4″	....	12.50
" "	..	8″	....	25.75
" "	..	6″	....	19.60
" "	..	12″	....	42.30
Minneapolis, Minn.	145	6″	....	13.80
" "	10	8″	....	21.00
" "	12	12″	....	39.25
" "	24	16″	....	87.60
" "	2	24″	....	263.50
Mont Alto, Pa.	3	6″	....	16.00
" " "	7	2″	....	6.00
Salt Lake, Utah.	..	6″	....	19.30
" " "	..	8″	....	27.00
" " "	..	10″	....	40.00
" " "	..	12″	....	50.00
Ponca City, Okla.	15	4″	....	6.35
" " "	2	6″	....	10.45
Grand Rapids, Mich.	2	4″	....	6.25
" " "	50	6″	....	10.10
" " "	11	10″	....	21.25
" " "	2	12″	....	30.00
" " "	2	16″	....	80.00
Herington, Kan.	..	4″	....	11.00
" "	..	6″	....	17.50
" "	..	8″	....	25.00
Almena, Kan.	2	2″	....	2.96
" "	5	4″	....	7.73
Findlay, O.	10	6″	....	13.24
" "	5	4″	....	8.25
" "	2	6″	....	11.00
Greenville, Tex.	21	6″	150	5.40
" "	4	8″	150	14.85
Pittsburg, Pa.	..	4″	40–120	7.00
" "	..	6″	....	10.60
" "	..	8″	....	15.95
" "	..	10″	....	23.50
" "	..	12″	....	29.00
Duluth, Minn.	..	3″	....	4.50
" "	..	4″	....	7.00
" "	..	6″	....	10.50
" "	..	8″	....	16.50
" "	..	10″	....	22.50
" "	..	12″	....	32.50
" "	..	16″	....	62.50

Furnishing Fire Hydrants

City	Name	Number	Size of Connection	No. and Size of Nozzles	Length Pavem't to Bottom of Trench	Price
Reading, O.	Bourbon.	3	.....	2–2½″	4′	$25.00
New Haven, Mo.	Carey	15	4″	2–2½″	3′	21.75
Portland, Ore.	Watrous	500	6″	4″ st'm'r. 2–2½″	4′	32.62
Cherokee	Mathews	1	.....	.....	.....	55.00
Pensacola, Fla.	Fairbanks	31	6″	1–4″ 2–2½″	3′ 5″	25.00
Trenton, Ill.	Carey	15	4″	2–2½″	3′	21.50
Prince Albert, Sask.	Mathews	9	.....	2″	.....	43.50
Bryan, O.	Bourbon	8	.....	3″	.....	47.50
" "	"	10	4″	.....	.....	5.23
Odessa, Wash.	Carey	4	4″	2–2½″	.....	34.00
Toronto, Ont.	.....	.....	.....	3″	.....	41.25
" "	.....	.....	.....	2″	.....	36.00
Winnipeg, Man.	.....	200	6″	2–2½″ 1–4″	8′	37.50
" "	.....	25	8″	3–2½″ 1–4″		
Minneapolis, Minn.	Mathews	140	6″	.....	9′	41.75
Mont Alto, Pa.	.....	5	4″	.....	.....	10.00
Salt Lake, Utah.	.....	50	.....	.....	.....	44.25
Ponca City, Okla.	.....	27	.....	.....	.....	25.25
Grand Rapids, Mich.	.....	50	5″	.....	.....	38.75
" " "	.....	6	6″	.....	.....	48.00
Herington, Kan.	.....	.....	.....	.....	.....	32.50
Almena, Kan.	.....	21	4″	.....	.....	26.47
Findlay, O.	Peerless	6	5″	.....	.....	28.50
" "	.....	3	4″	.....	.....	24.00
Greenville, Tex.	Peerless	68	6″	2–2½″	5′	21.95
Pittsburg, Pa.	Ludlow Type	.....	4″x6″	1″	.....	20.00
" "	.....	.....	6″	2″	.....	42.25
Duluth, Minn.	Mathews	.....	.....	.....	.....	39.75

PERSONALS

BLACKWELL, F. O., New York, N. Y., member of the consulting engineering firm of Vielé, Blackwell & Buck, has been elected a member of the Institution of Civil Engineers.

BOLLER & HODGE, New York, N. Y., have been retained by the city of St. Louis, Mo., to design and superintend the construction of the proposed free bridge across the Mississippi River.

BOLTON, JACKSON, Richmond, Va., First Assistant City Engineer, has resigned after 40 years' continuous service with the City Enginering Department.

BROAD, FRED. A., Lynn, Mass., has been elected Secretary of the State Aid Committee.

BURTON, CLYDE A., Mitchell, Ind., has succeeded W. L. Brown, resigned, as Mayor.

CACCAVAJO, JOSEPH, New York, N. Y., has been retained by a syndicate of Japanese capitalists to study conditions in several of the largest cities of Japan with a view to the construction of systems of rapid transit.

CARNER, AMBROSE H., New York, N. Y., formerly managing director of the New York & Bermudez Company, and receiver for the asphalt property after its confiscation by the Venezuelan government, died at Port of Spain, Trinidad, on January 16.

CARTER, H. E., Bolivar, Tenn., has been elected Mayor.

COLVIN, DR. J. T., Oldum, Ga., has been elected Mayor.

CUNNINGHAM, FRED, Linton, Ind., has resigned the position of City Engineer.

HANKINS, A. C., Jamaica, L. I., N. Y., has been appointed Superintendent of Street Cleaning, succeeding James E. Conlin, resigned.

HEFFRON, JOHN W., Rockville, Conn., Chief of the Fire Department, has resigned.

HIGGINS, J. H., Providence, R. I., has been elected President of the Board of Aldermen.

HOBBS, MAJOR T. B., Mayor of Saltville, Va., for the past eight years, died recently aged 62 years, after an illness of four months.

HODGE, B. J., Building Inspector of Nashville, Tenn., has been named as a member of the Board of Public Works by Mayor James S. Brown, to succeed C. Ross Handly, deceased, and Edward Laurent, architect and former Building Inspector, has again been appointed to the position, vice Hodge.

HORNUNG, GEORGE & SON, Cincinnati, O., have been engaged as consulting engineers to report on water supply for College Hill, O.

HORTON, THEODORE, Albany, N. Y., has been reappointed Chief Engineer of the New York State Department of Health.

JOHNSON, JOHN S., Lockport, N. Y., has been appointed by Mayor Minard as Superintendent of Streets, William E. Fleckser, Inspector of Lamps and Gas, and William G. Spalding, City Clerk, the three having been successful in Civil Service examinations held for the positions.

JONES, DR. R. L., Hugo, Okla., has been elected Mayor to succeed L. W. White, resigned to take a seat in the Legislature.

KEELER, CAPT. ALEXIS, first Chief of Police of Columbus, O., died Jan. 27, as a result of old age.

KELSEY, F. C., Portland, Ore., has been selected by the City Council of Tacoma, Wash., to superintend the design and construction of a large hydro-electric plant to be built on the upper Nesqually River.

LAMBERTON, A. B., President of the Park Board of Rochester, N. Y., has been reappointed as a member by Mayor Edgerton and re-elected head of the Board, while H. F. Atwood, William C. Barry and B. J. McQuaid have also been reappointed and Thomas Raines has been appointed a member to succeed George Raines, deceased. Bishop McQuaid, one of the reappointees, has since died.

LEDERLE, DR. ERNEST J., New York, N. Y., has been appointed Expert Sanitary Engineer by the Board of Water Supply of New York City.

LUTHER, WM. H., Chairman of the Police Commission of Providence, R. I., has been reappointed as a member of the commission for his fourth term.

MATTISON, SELIM, City Engineer of Ponca, Neb., dropped dead in the pumping station of the city, recently; he was 50 years old and had been a resident of Ponca for many years.

O'CONNELL, MICHAEL, New Brunswick, N. J., has been appointed Chief of Police, succeeding Francis Harding, who resigned after twenty years of service.

OLLRE, R. F., Houston, Tex., has been appointed Chief of the Fire Department, succeeding the late Thos. O'Leary.

PANCOAST, A. C., San Antonio, Tex., has been appointed City Engineer by Mayor Callaghan, succeeding J. E. Van Riper; Mr. Pancoast served the city as engineer during the construction of the sewer system, previous to which he had been Assistant City Engineer under Mayor Callaghan's former administration; during his term as County Engineer of Bexar County, the work of constructing the County roads and water works system was performed under his direction. The new appointee had charge of the engineering work in the construction of the water works and the sewer system recently installed in Monterey, Durango and Torreon in the Republic of Mexico, and under his supervision an extensive sewer system and water works plant were recently put in at Saltillo, Mex. During the last three and a half years he has been at the head of the engineering work being done near Rio de Janeiro, Brazil, receiving a salary of $3,000 per annum. Mr. Pancoast quit that position to return to San Antonio.

PILLSBURY, HAZEN G., Lowell, Mass., has been elected Clerk of the Water Board.

PLUMMER, H. E., Portland, Ore., has been appointed Engineer in the Department of Building Inspection. He was formerly structural engineer for Hegardt & Brown, consulting engineers, of Portland.

QUA, STANLEY E., Lowell, Mass., has been elected President of the Common Council; Frank M. Dowling has been re-elected Clerk.

QUINLAN, MICHAEL, Sealer of Weights and Measures of Lockport, N. Y., has been reappointed by Mayor Minard.

RAMSDELL, ROBERT E., Lynn, Mass., has been elected City Treasurer, succeeding the late Hartwell S. French.

REICHMAN, MOSES, Newark, N. J., has been appointed Tax Commissioner, succeeding Philip Lowry.

RIDGE, RIENZI, Portsmouth, N. H., has been elected Street Commissioner, William P. Young, City Inspector; James H. Dow, Health Inspector; Ernest L. Bogart, Inspector of Plumbing; Frank Horrocks, Inspector of Petroleum; Edwin W. Gray, Sealer of Weights and Measures; John D. Randall, Chief Engineer of Fire Department; Joseph W. Akerman and William F. Woods, Assistants; William M. Ballard, Superintendent of Fire Alarm Telegraph and Inspector of Wires.

SCANLON, PHILIP, Newark, N. J., has been appointed a Police Commissioner.

SHELDON, JESSE, Holyoke, Mass., has been elected Water Commissioner.

STRAUB, THAD, Mayor of Hamilton, O., has returned from a two weeks' trip to Florida, where he owns an orange and grape plantation.

SUTTON, ARTHUR J., Woonsocket, R. I., has been appointed Fire Marshal, succeeding George W. Richard, now City Auditor.

TIEDMAN, GEORGE W., Mayor of Savannah, Ga., has been re-elected; R. M. Hull and A. Vetsburg take the places of R. J. Davant and J. D. Epps as Aldermen.

WASHMAN, CHARLES E., Hillsboro, Tex., has been elected Chief of the Fire Department, succeeding Ed. Martin, resigned; Max Haus was elected First Assistant, vice Washmanaud; Jesse Sweeney, second assistant.

WEST, HENRY L., Washington, D. C., has been nominated by President Roosevelt to serve another term as Commissioner of the District of Columbia.

INCORPORATIONS

American Gas and Power Company, Camden, N. J.; to manufacture, generate and produce light, heat and power; capital, $1,000,000. Incorporators: William S. Darnell, M. H. Darnell, George D. Connelly, Camden.

American Water Supply Company, Newark, N. J.; to deal in machinery, tools, mechanical devices, etc.; capital, $400,000. Incorporators: Lawrence W. Luellen and Hugo Moore, 115 Broadway, New York; Austin M. Pinkham, 27 State street, Boston, Mass.

Audit Engineering Company, New York, N. Y.; consulting chemical engineers; capital, $100,000. Incorporators: A. F. Woolley, 17 West 108th street, New York; J. W. Ebbs, Englewood, N. J.; E. M. Maloney, Brooklyn.

Black River Power Association, Watertown, N. Y.; to improve the flow of Black River; capital, $5,000. Incorporators: J. P. Lewis, Beaver Falls; H. J. Caldwell, Carthage; David M. Anderson, Watertown.

Central Artesian Well Company, Moss Point, Miss.; capital, $10,000. Incorporators: A. S. Denny, C. M. Fairiley and others.

Consumers' Electric Light Company, Mannington, W. Va.; capital, $100,000. Incorporators: C. E. Morris, H. A. Nolk, Herman A. Hundt and others.

Dunbar Contracting Cmpany, New York, N. Y.; general contracting, public work, buildings, etc.; capital, $1,000. Incorporators: Bart Dunn, 247 East 71st street; Benjamin Tuite, 1177 Third avenue, both of New York; Henry Gressler, 1378 Boston road, The Bronx.

El-Oso Asphalt Company, St. Louis, Mo.; capital, $300,000. Incorporators: Frank O. Blake, Frederick C. Blake, Francis H. Blake and others.

Erwin Water Company, Erwin, Tenn.; capital, $10,000. Incorporators: A. R. Brown, J. F. Toney, Benjamin F. Bogart and others.

Fort Atkinson Gas Company, Fort Atkinson, Wis.; capital, $25,000. Incorporators: N. D. M. Bradt, M. D. Foster, D. G. Stroebel.

Interstate Engineering and Supply Company, Camden, N. J.; builders and contractors for constructing railroads, water, gas or electric works, tunnels, bridges, viaducts, etc.; capital, $100,000. Incorporators: F. R. Hansell, William F. Eldell, John A. MacPeak, as above.

Kershaw Construction Company, Talladega, Ala.; capital, $25,000. Incorporators: C. G. Kershaw, J. F. Hanks and J. K. Dixon.

Matamoras Quarries Company, Jersey City, N. J.; to quarry marble, slate, granite, etc.; builders and contractors; capital, $250,000. Incorporators: H. O. Coughlan, S. A. Anderson, John R. Turner, as above.

Northwestern Light and Power Company, Mayville, Wis.; capital, $5,000. Incorporators: H. J. Schlesinger, Armin A. Schlesinger, Edgar N. Dickson.

Scientific Waterproofing Engineering Company, East Orange, N. J.; goods, wares and merchandise; capital, $10,000. Incorporators: Abraham Goldstein, 30 Carleton street, East Orange; Alfred Rosenblatt, Cedarhurst, L. I.; Charles L. Boyle, 54 St. Paul's avenue, Jersey City.

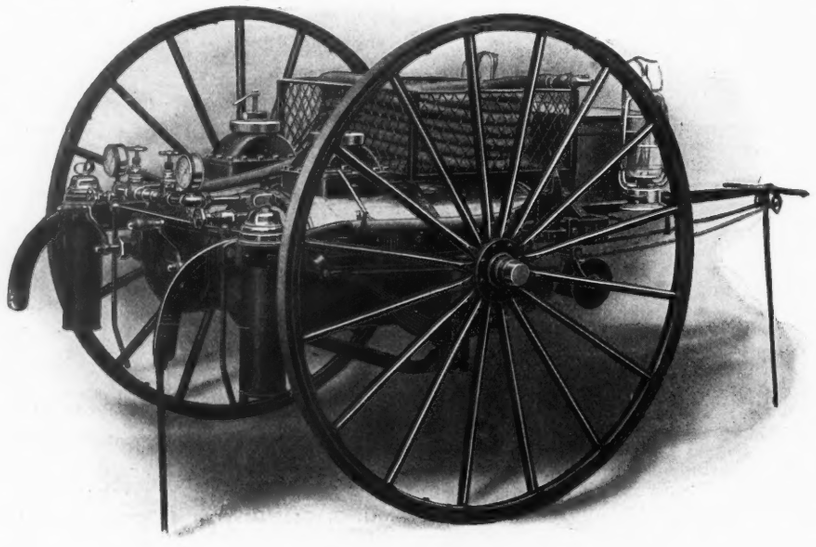
United Water Improvement Company, Wilmington, Del.; capital, $10,000,000. Incorporators: H. J. Love and F. Maurer, Philadelphia; William M. Pyle, Wilmington.

U. S. Coal Saver and Smoke Consumer Company, Augusta, Me.; to manufacture and sell smoke-saving devices; capital, $1,000,000. President and Treasurer, J. Berry; Clerk, J. Williamson, both of Augusta.

MUNICIPAL APPLIANCES

Chemical Fire Engines.—The American-La France Fire Engine Co., of Elmira, N. Y., manufactures a complete line of chemical fire apparatus of all sizes from horse-drawn apparatus to portable extinguishers easily carried in the hands. A large percentage of all fires is extinguished by the use of chemical apparatus in all cities where fire departments are well equipped with this type of apparatus. The chemical engine is self-contained. It consists of a copper or steel tank filled with water containing bicarbonate of soda in solution. Sulphuric acid is contained in a sealed bottle or receptacle. The machine is put in operation by the discharge of the acid into the alkaline fluid. Carbonic acid is generated under pressure and the water impregnated with gas is discharged. An excess of soda is used in order to prevent injurious effects of acid on goods in the burning building. A fire engine of considerable power may be placed on a two-wheeled truck and propelled by hand. Such an appliance is the Holloway Chemical Fire Engine built by the American-La France Company, which carries two stationary cylinders, capacity thirty gallons each. The exact specifications of this apparatus are as follows:

Cylinders—Two (2) 30 gallons capacity each, horizontal, Holloway, mounted on two wheels, hard rolled copper.
Frame—Forged steel.
Wheels—Best grade.
Hub Caps—Polished brass.
Tires—Round edge steel.
Axle—Solid collar.
Springs—Best oil tempered springs, half elliptic.
Hand Pole—Forged, fitted with pole crab and hand holes.
Rope Reel—One (1).
Drag rope—Fifty (50) feet of manila.
Acid Chamber—Brass acid chamber on top of tank at rear end, of latest improved pattern. Spun sheet lead, copper casing and cast brass top with German silver valve, all carried in cast brass cage, revolving on brass trunnions.
Overflow Valve—Overflow valve and pipe on end of tank to regulate the charge of water. This valve can also be used as a blow-off.
Washout Spud—Washout spud in bottom of tank.
Agitator—Agitator extending the entire length of tank, revolved by handle on rear end. This agitator thoroughly dissolves the soda and prevents it settling in the bottom of the tank. Cast brass paddles on brass pipe shaft, tinned.
Discharge Pipe—¾-inch brass pipe.
Valves—Cast brass, angle, ground joint.
Brass Work—All brass work on tanks polished, tanks painted.
Hose—100 feet ¾-inch special four-ply rubber chemical hose, with brass couplings attached.
Nozzle—Eccentric, with rubber valve, chemical engine standard, two tips.
Basket—Wire, for carrying hose, of ample capacity.
Acid Receptacles—Four (4), of chemically pure lead encased in copper sheathing, heavily tinned.
Tool Box—Combination, for tools and chemical charges.
Soda Bags—Two (2).
Hose Spanners—Two (2).
Wrenches—All necessary wrenches.
Lanterns—Two (2) Fire Department style, with holders.
Axe—One (1) Fire Department style, with holder.
Crowbar—One (1) Fire Department style, with holder.
Pressure Gauge—One (1).
Painting—English vermilion, striped.
Striping—Gold leaf.
Lettering—To order.
Track—4 feet 8 inches.
Width—Over all, 5 feet 6 inches.
Height—Over all, 55 inches.
Length—Over all, 9 feet.



LA FRANCE CHEMICAL ENGINE

PATENT CLAIMS

910,481. Arc-Lamp. Richard Fleming, Lynn, Mass., assignor to General Electric Company, a corporation of New York. Serial No. 293,590.

As an article of manufacture, an arc lamp electrode formed as a rod having a number of supporting wings projecting laterally therefrom.

910,495. Means for the Purification of Water. Douglas L. V. Browne, San Francisco, Cal., assignor to James B. Miller, San Francisco, Cal. Serial No. 398,446.

In an electrolysis box, a tank, an inlet and an outlet for said tank, a series of anodes and cathodes in said tank formed of several kinds of metals, and a series of carbon anodes and cathodes placed in said tank to act on the liquid passing through the same subsequent to the action of the metal plates.

910,552. Ditching Machine. Torbjörn Linga, Thor, Iowa. Serial No. 457,378.

A ditching machine comprising a motor-propelled structure, a revoluble digging wheel mounted to swing vertically relative thereto, a conveyor at one side of and movable vertically with the wheel, and means for maintaining the conveyor in a predetermined relation to the horizontal.

910,568. Pavement and Method of Constructing the Same. James A. Omberg, Jr., Memphis, Tenn. Serial No. 440,678.

A street car or other track comprising track rails, a filling of concrete between said rails, and a reinforcement of structural metal having a part embedded in the concrete and having an upper surface exposed adjacent to each track rail and lying parallel with said rail to form a groove or channel along the inside of the head of the rail.

910,658. System of Lighting by Arc Lamps. Richard Fleming, Lynn, Mass., assignor to General Electric Company, a corporation of New York. Serial No. 360,809.

In combination, an alternating current circuit, a pair of arc lamps each having dissimilar electrodes, a connection between the corresponding electrodes of the lamps and connections between each of the other electrodes and opposite sides of the circuit.

910,670. Arc Lamp. Cromwell A. B. Halvorson, Jr., Lynn, Mass., assignor to General Electric Company, a corporation of New York. Serial No. 352,523.

In an arc lamp, a hood, a platform, a central tubular backbone member connecting the hood and platform together and constituting the main chimney of the lamp, a movable auxiliary chimney telescoped within the backbone member, an electrode carried at the lower end of the auxiliary chimney, and clutch mechanism engaging the auxiliary chimney for controlling the position of the latter and of the electrode carried thereby.

910,577. Method and Apparatus for Molding Concrete Pipes. Ernest L. Ransome, New York, N. Y. Serial No. 356,183. Renewed Nov. 16, 1908. Serial No. 462,915.

The combination of a mold, a core, a reinforcing cage received between the mold and core, longitudinally extending guides on the mold and core and longitudinally extending beams fastened to the reinforcing cage and engaging said guides of the mold and core.

910,578. Apparatus for Laying Concrete Pipes. Ernest L. Ransome, New York, N. Y. Serial No. 365,517. Renewed Nov. 16, 1908. Serial No. 462,916.

An apparatus for molding concrete pipe in situ, having a series of collapsible core sections capable when collapsed of resting on and moving through each other and automatic devices for dragging the collapsed sections through the other sections when the collapsed sections are resting on the other sections.

910,705. Street Crossings. Simon B. Minnich, Landisville, Pa., assignor to Mary C. Minnich, Landisville, Pa. Serial No. 430,840.

In a street crossing of the class described, U-shaped longitudinal sides formed with an edge protecting flange, stay-rods securing said sides in a spaced relation, one to the other, a wear plate removably secured to the outer surface of said sides and adapted to protect the edges of said sides.

910,687. Flexible Pipe-Joint. Charles H. Jenkins, Louisville, Ky. Serial No. 441,823.

In a flexible pipe joint, a ball section, a socket section having equidistant interior seats, and a concave annular wall at its outer end adapted to abut against the ball section to prevent outward movement thereof, and means for preventing inward movement of the ball section including removable stationary stud pieces fitting in the seats of said socket section and having concave inner faces abutting against the inner half of the convex wall of the ball section.

910,836. Ditcher and Road Grader. John D. Martin, Reynolds Station, Ky. Serial No. 452,291.

A machine of the class described comprising a runner, a scraper blade hinged to the runner, a tie rod pivotally connected to the scraper blade and having a hook terminal, a plurality of eyes projecting from the inner face of the runner centrally thereof and adapted to receive the hook terminal of the tie rod to angularly adjust the scraper blade with respect to the runner, disk wheels rotatably mounted on the runner, an adjustable arm supported at the rear end of the scraper blade and having a ground roller, a platform arranged between the runner and adjustable blade and hangers detachably connecting the platform to the runner.

910,966. Testing-Plug for Pipe Systems. Joseph Simon, Chicago, Ill. Serial No. 427,484.

A device of the kind specified comprising two opposed plates, central tapered projections on each of said plates opposing each other, an expansion member of resilient material seating on the beveled faces of said projections and adapted to be expanded against the inner face of the pipe to be plugged as said plates are moved toward each other, a central threaded projection on one of the said plates passing loosely through a central opening in the other thereof, there being a longitudinal groove in said projection, a projection on the wall of the opening through which said threaded projection passes entering said groove to hold said plates against relative rotation, a nut on said threaded projection, and levers pivotally secured to said nut and equipped at their ends with surfaces disposed eccentrically to said pivots and adapted to bear on the last-named plate to force the same toward the other when said levers are turned in one direction.